Magnus Lindskog

Forecasting and responding to qualification needs in Sweden

This contribution is part of a series of publications from the project "Qualification Needs in OECD Countries - Identification, Analysis and Implementation". The project is part of the FreQueNz-Network (www.frequenz.net). The aim is to provide systematic identification of future skill needs. FreQueNz is co-financed by the Federal Ministry of Education and Research (BMB+F).

September 2003

ISSN Nr. 1011-9523

Wissenschaftszentrum Berlin
für Sozialforschung (WZB)

Forschungsschwerpunkt:
Arbeit, Sozialstruktur und Sozialstaat

Abteilung:
Arbeitsmarktpolitik und Beschäftigung
http://www.wz-berlin.de/ars/ab/
e-mail Magnus Lindskog: lindskog@wz-berlin.de

Bestell-Nr.: SP I 2003-105

Abstract

There are more people exiting than entering their active working life in Sweden every year. In addition, the ongoing restructuring of labour markets implies significant changes in occupational structures and skill requirements. Under such conditions it is perhaps more important and more challenging than ever, to ensure efficient matching of qualification supply and demand. The central theme of this paper is the identification and tackling of labour market mismatches where unemployment and labour shortages are found simultaneously.

There are various different actors engaged in the forecasting of labour market developments in Sweden but Statistics Sweden (SCB) and the National Labour Market Administration (AMV) stand out as the main providers. Recent forecasts indicate diminishing recruitment problems in Sweden but they also highlight several exceptions to this trend, in particular within the municipality sector. Other non-matched skill needs include technical qualifications and, in the long run, construction workers. The forecast results are used for planning with the system of qualification supply, in particular concerning the need for labour within occupations with clearly identifiable qualification demands. Nevertheless, the forecasts are based on relatively strong assumptions and they are unable to fully account for the innovation of new jobs and new types of education. An important aspect of the Swedish adjustment process is the ongoing interactions with the surrounding society.

The paper accounts for forecast models and methods, recent results as well as availability of relevant reference statistics in Sweden. The discussion on tackling of mismatches accounts for active public supply adjustment aiming for optimal distribution of the supply labour by type of qualification. The main institutions within the Swedish system of qualification supply are discussed with focus on the links between training supply and forecast results, government management and institutional framework, general supply strategy and measures, and networks with the surrounding society. The paper also includes a section presenting some examples of recent trends and developments of skill matching in Sweden.

Zusammenfassung

In Schweden ziehen sich jedes Jahr mehr Menschen aus dem aktiven Erwerbsleben zurück, als neue eintreten. Zusätzlich führen kontinuierliche Strukturveränderungen der Arbeitsmärkte zu starken Veränderungen in der Beschäftigungsstruktur und den Qualifikationserfordernissen. Unter diesen Bedingungen ist es möglicherweise wichtiger als je zuvor, effizientes Matching zwischen dem Angebot an und der Nachfrage nach Qualifikationen zu sichern. Zentrales Thema des vorliegenden Beitrags ist die Identifikation und Reduzierung von qualifikatorischem Mismatch, der sich durch die Gleichzeitigkeit von Arbeitslosigkeit und Fachkräftebedarf auf den Arbeitsmärkten ausdrückt.

Es gibt verschiedene Akteure, die an Arbeitsmarktprognosen in Schweden arbeiten, wobei das schwedische statistische Zentralbüro (SCB) und die schwedische nationale Arbeitsmarktverwaltung (AMV) mit Abstand die wichtigsten sind. Aktuelle Prognosen zeigen vermindernde Rekrutierungsprobleme in Schweden, aber sie heben auch einige Ausnahmen zu dieser Tendenz hervor, insbesondere bei Tätigkeiten im Bereich der Gemeinden. Andere nicht erfüllte Qualifikationserfordernisse schließen technische Qualifikationen und langfristig auch Bauarbeiter ein. Die Resultate der Prognosen werden für die Planung im Bildungssystem verwendet, insbesondere hinsichtlich des Bedarfs innerhalb von Berufen mit leicht identifizierbaren Qualifikationen. Allerdings basieren die Prognosen auf verhältnismäßig restriktive Annahmen und sie sind nicht imstande, neue Tätigkeitsprofile und neue Berufe zu erkennen und zu berücksichtigen. Darüber hinaus ist der Prozess des Ausgleichs zwischen Angebot von und Nachfrage nach Qualifikationen in Schweden durch kontinuierliche Interaktionen zwischen dem Aus- und Weiterbildungssystem und der Gesellschaft gekennzeichnet.

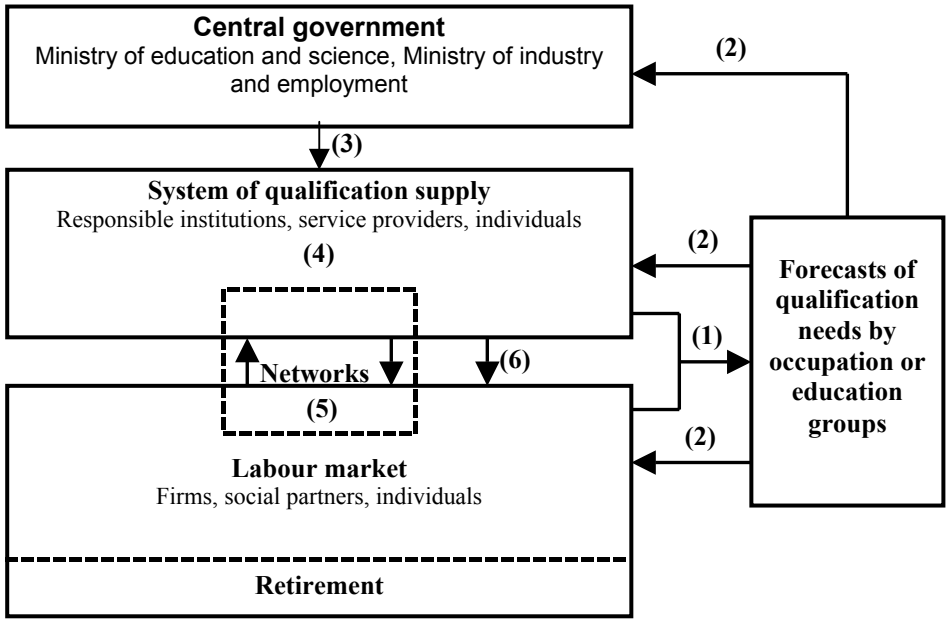
Das vorliegende Papier berichtet über Prognosemodelle und -methoden, aktuelle Ergebnisse sowie über die Verwendbarkeit relevanter Referenzstatistiken in Schweden. Des Weiteren werden Maßnahmen gegen Fehlentwicklungen diskutiert, die durch aktive Anpassung des allgemeinen Angebots auf optimale Verteilung des Angebots an Qualifikationen zielen. Die wichtigsten Institutionen des schwedischen Bildungssystem werden mit Fokus auf ihre Verbindungen zwischen Bildungsangebot und Prognoseergebnissen, staatliche Steuerung und institutionellem Rahmen, allgemeine Angebotsstrategien und Netzwerkbildung mit der übrigen Gesellschaft verglichen. Das Papier schließt auch einen Abschnitt ein, der einige Beispiele neuer Tendenzen und Entwicklungen in der Anpassung an Qualifikationserfordernisse in Schweden darstellt.

Table of contents

Introduction

The future supply of labour has become one of the major challenges of our time, and to some extent, the future is already present. There are already more people exiting than entering their active working life every year. Add to this, the ongoing restructuring of labour markets and significant changes in occupational structures and skill requirements. Under such conditions it is perhaps more important and more challenging than ever, to ensure efficient matching between supply and demand for certain qualifications. The reconstruction process in Sweden has implied a generally declining relative demand for low skilled workers. Nevertheless, labour market needs are only partly matched by increasing the supply of labour with a certain *level* of qualification. It is also crucial to analyse matching by *type* of qualification. This report focuses on *types* of qualifications, understood as qualifications related to a certain occupation or education group. The central problem on this level is the mismatch between demand and supply of specific skills on the educational market as well as on the labour market. Observable examples of such mismatches can be, when courses with vacant places do not correspond to the needs of the employers and/or young people's aspirations; and on the labour market, when unemployed skilled workers and a shortage of skilled workers can be found simultaneously. The purpose of this report is to describe the public strategies to avoid such mismatches in Sweden, in particular shortages of certain types of qualifications. The figure below delineates the scope and structure of the report.

Figure 1: Identification and response to qualification mismatches



The right-hand side of the figure corresponds to the first two sections in the report. The first section describes the models and methods employed to project qualification needs, represented by arrow (1). Arrow (2) illustrates information about forecast results to decision-makers, education planners, individuals, employers, etc. Some of the principal forecast results are presented in Section 2. The third section accounts for the public strategies to match the needs of the Swedish labour market. There is an implicit assumption that wages are decided by the market, which implies that the wage adjustment mechanism is outside the scope of the paper. The discussion includes information regarding Government management, the institutional framework, and a description of the types of education/training, represented by (3) and (4) in the figure. It also accounts for networks (5) between education/training providers and labour market parties for ongoing adjustment of the qualification supply according to the labour market needs. The supply adjustment strategy, represented by (6), with special attention given to education/training dimensions is also described here. Section 4 provides a few examples of developments related to qualification supply. Finally, Section 5 summarises the report and presents some concluding remarks.

1. Identification of Qualification Needs

This part of the report focuses on recent and regular forecasts projecting qualification supply and demand on the whole labour market by occupation or educational group. These forecasts serve to provide indications of the changes in relative supply quantities required to avoid future mismatches. Some personnel projections within sectors, which either employ a significant share of the Swedish labour force or which have been identified as major shortage areas are also briefly accounted for below. The structure of the section distinguishes between forecasts and personnel projections by type of forecast provider. There are various different actors engaged in the forecasting of labour market developments in Sweden but Statistics Sweden (SCB) and the National Labour Market Administration (AMV) stand out as the main providers. In contrast to other actors they are public authorities assigned with the task to carry out labour market projections. Their publications, which are available for free download on the Internet, include forecast results and analyses. They are used in long-term studies and also for planning by authorities, schools and individuals. The information functions as reference information for study and employment orientation, for individuals choosing educational and vocational focus, for educational planning and for general information in education and labour market issues. Other actors briefly accounted for below engage in forecasts to promote business development or to make personnel projections within a certain industry sector.

1.1 Forecasts by Statistics Sweden

Statistics Sweden (SCB) has carried out forecasts of supply and demand of qualifications, by type of education, since the 1960s. The aim is to calculate the balance between demand and supply and to highlight potential imbalances. The traditionally most central analysis on this topic is 'Trends and forecasts', which has been published every third year since 1972 by SCB on assignment from the Government. The purpose of this long-term forecast is to provide an overview of the demographic development and the trends of education and the labour market. Focus is primarily on long-term developments showing the supply and demand for around 50 educational groups for the next two decades. A complimentary forecast is provided in 'Education and the demand for labour', which is published when 'Trends and forecasts' does not come out. It was published for the fist time in 1999 and the second edition came out 2001. The purpose of this report is to delineate the potential impact of labour market flows on recruitment needs for 50 different education groups on the medium-term.

Statistics Sweden also publishes short-term forecasts named 'Labour Market Tendency Survey', annually since 1959. It is a sample survey conducted by means of questionnaires providing information about the labour market situation and the outlook for 77 educational and training categories, of which 56 are higher education programmes. The results are based on the answers from a selection of employers with employees corresponding to these education groups. The selection for 2001 comprised 7600 employers. Concerning education groups represented at less than 150 work-places within the selection frame, all work-places are included. Regarding other education groups, a selection of 150 work-places is made. The population from which the selection is made includes all Swedish work-places with at least ten employees (five for certain education groups). The information about the number of employees a certain employer has hired is applied to weight the answers to the question about the supply of applicants (recruitment situation).

The employers are requested to estimate the supply of applicants (good/balanced/shortage) and to make a judgement about how the number of employed with a particular educational background will change on a one-year and three-year perspective (increase/no change/decrease). On the basis of the answers to the questionnaires, SCB provides a report of the recruitment situation, the share of employers with vacancies, and the demand for labour with a particular educational background. Confidence intervals on the 95 percent level are calculated for the figures, and if it exceeds +/- 60 the result is not presented. Likewise, results are not published if the number of answers is below ten.

Users of the Labour Market Tendency Survey include study and careers counsellors at employment offices and schools, educational planners, people who are on the point of making decisions about their continued education or training, and

others who want more information about the outlook for various educational and training categories.

Forecast model in ‘Trends and forecasts’

Trends and forecasts is a projection of labour market stocks. The demand for different education groups starts with a population and labour force survey and a forecast of the economic trend based on econometric models for the private and public sectors. This provides the demand for labour within different industry sectors. Then assumptions are made regarding the changes of the education structures by industry sector. Note that the forecasts of total employment within the private and public sectors are not based on judgements of demand for labour within different industry sectors. Consequently, the allocation of employed by industry sector given by the models for the private sector and the calculations for the public sector is optimal, given a total number of employed. The calculations of the future labour force and the number of employed distinguishes between sex and seven age groups. The employed are divided into 40 industry sectors for which assumptions are made regarding the distribution between close to 100 education groups. The outcome is presented as supply and demand for slightly more than 50 of them.

Figure 2: Forecast model in trends and forecasts

Supply				**Demand**		
The population’s education 2000	→	Education	→ ←	Education	←	Labour Force survey
Forecasted examinations	→	A B	→ ←	A B	←	Economic trend
Retirement exits	→	C D	→ ←	C D	←	Forecasted industry sector trend
Employment ratio	→	· etc	→ ←	· etc	←	Education requirements

Source: Statistic Sweden 2002b

Table 1: Demand and supply calculations in 'Trends and forecasts'

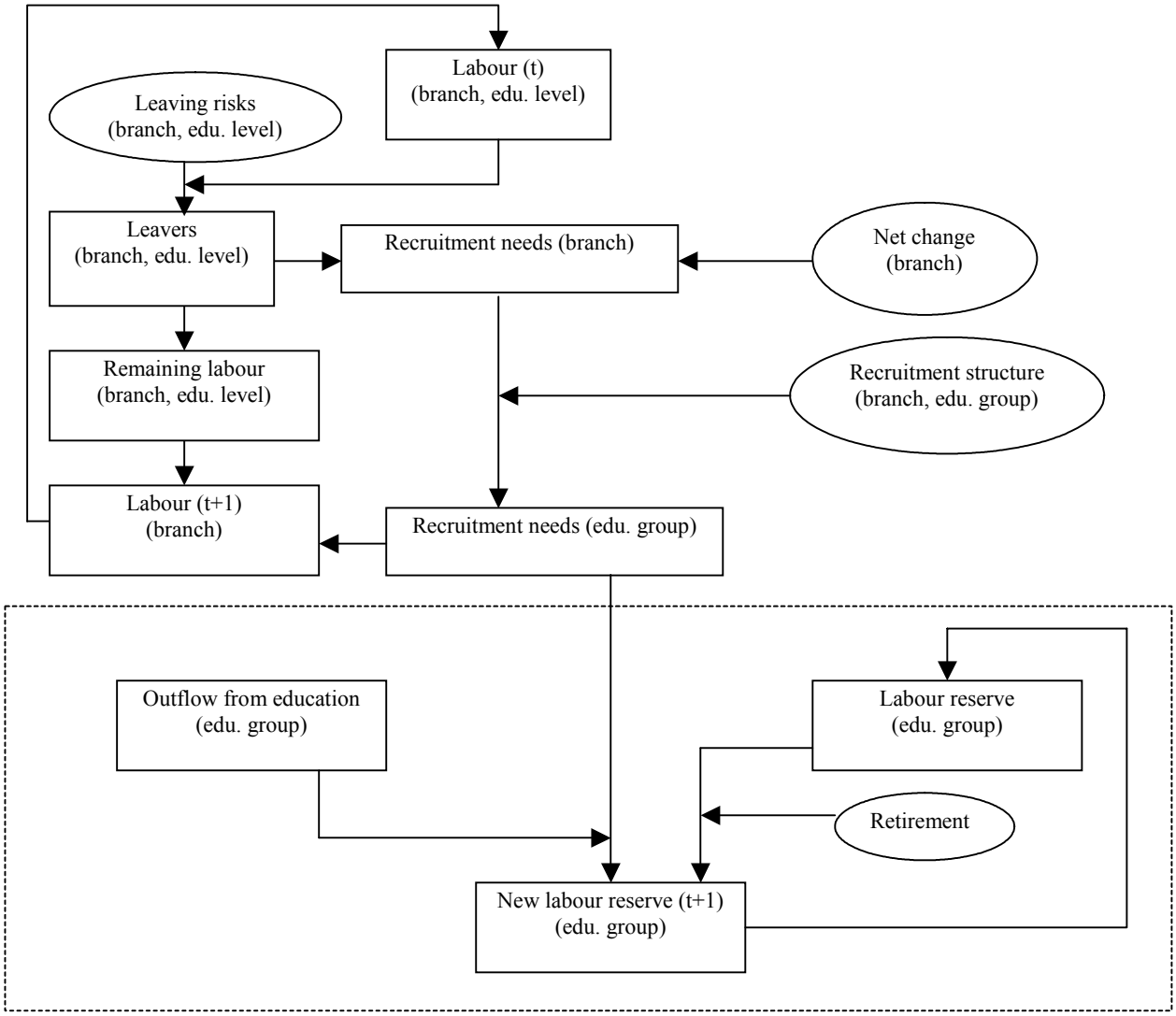
Demand for educated – Model for the calculations		
1.	Population and labour force survey	The total number of employed, by age group and sex, during the next 20 years. The calculation is based on forecasts concerning the development of the population (based on assumptions regarding fertility, net immigration and life expectancy) and labour force participation (based on assumptions of labour force participation and unemployment).
2.	Economic trend	Calculations of the economic trend during the next 20 years based on econometric models for the private and public sectors, taking into account demographic developments and the total number of employed.
3.	Employed by industry sector	Forecast of the number of employed by industry sector during the next 20 years based on the result from the calculations in step 1 and step 2.
4.	Education structure by industry sector	Assumptions regarding the future distribution of education groups by industry sector based on changes occurring during the 1990s.
5.	Assumptions of structural changes	
6.	Education structure by industry sector	
7.	Demand for educated	The model provides results about the labour market demand for educated during the next 20 years
Supply of educated – Model for the calculations		
1.	The population's education year t	Multiplying the population in year t (1) with survival probabilities (2) gives the population in t+1 by education structure in t (3) broken down by sex, age, and education
2.	Survival probability	
3.	Survivors in t+1	
4.	Examinations from education in t+1	The number of examinations during t+1 by type of education in year t (4) is added to survivors in t+1 (3) and, simultaneously they are subtracted from the type of education they had in year t (5). The calculation comprises of all types of education with the exceptions of personnel training, study circles, private education that do not entitle the participants to study allowance, and net immigration is also taken into account. The result gives the population's education 2001 broken down by sex, age, and
5.	Examinations in t+1 by type of education year t	
6.	The population's education in t+1	
7.	Assumptions of employment ratio	Multiplying the population's education in t+1 (6) with the employment ratios in t+1 (7) gives the supply to the labour market in t+1 by sex, age, and education (8)
8.	Labour market supply in t+1	

Source: Based on information in Statistic Sweden 2002b

Forecast model in ‘Education and demand for labour’

In contrast to ‘Trends and forecasts’ the forecast in ‘Education and demand for labour’ calculates labour market flows with the objective to compare new supply with estimated recruitment need. The main outcome is a judgement of the labour market situation for 50 educational groups during the next 8 years. Recruitment need is calculated by branch and the total need equals the sum of the number of persons, needed to replace leavers and the net change of total employed within the branch. The calculations are based on exogenously given assumptions about the future number of workers divided into 42 branches. Leavers are estimated on the basis of risks (probabilities) for exits into retirement, early retirement and education, by age, sex and (rough) education level. Yearly stocks are corrected for by leaving and recruited labour. The calculation gives the yearly recruitment needs by branch, divided into 94 education groups, although the results are reported in significantly fewer groups. In the final step recruitment needs are compared to the outflows from education. In order to make this comparison more meaningful, the available labour reserve for each education group is reported next to recruitment needs and outflows. In cases where the recruitment needs plus retirements from the labour reserve are greater than the outflows from education there is a decrease in the labour reserve and vice versa. As can be seen in the figure below, the flows within the labour market are not considered in the model. They are assumed to net out, which implies that the result by education group could be biased. Another assumption in the model is that the flows from employment to inactivity (other than retirement or early retirement) equal the flows from these groups into employment.

Figure 3: Forecast model in 'Education and demand for labour'



Source: Statistic Sweden 2001

Forecast model assumptions

In the following, the most recent 'Trends and forecasts' will serve to demonstrate the assumptions behind the supply and demand calculations made in the SCB models. The calculations of the number of employed is partly based on the most recent judgements for the private sectors undertaken by Langtidsutredningen (LU)[1] and partly on SCB's own calculations of the demand in the public sector. The projections for the private sectors by LU are based on calculations with econometric models taking into account global trade developments, Sweden's exports shares, and productivity development by industry sector. The judgements for the public sector are based on the demographic development in those age groups consuming public sector services.

The estimations concerning the structure of education demand is based on education groups by industry sector. 'Trends and forecasts' makes two alternative assumptions regarding the future qualification requirements within a certain industry sector[2]. In alternative A the education structure is assumed to develop at the same rate as during the 1990s and in alternative B the rate is assumed to be half as fast as during the 1990s. The reason behind alternative B is that the labour market during 1990s can be considered as "the employers' market" since supply was significantly higher than demand, which implies that the employers had the possibility to require higher qualifications than necessary for the specific tasks. Hence, alternative B could illustrate a more "normal" labour market situation. For updating of education groups the education providers report on new education to the education register, which is used by the SUN council to classify them according to SUN (the Swedish version of ISCED).

On the supply side the calculations of labour force participation takes into account expected impacts of the new pension system, where payments are based on lifetime income, and assumptions about delayed entry into the labour force as a result of increased participation in education. Turning to the inflow from the different parts of the education/training system it is assumed that the share of 16 year olds attending upper secondary education remains the same as during 2000/2001. Both the share and the distribution by programme are expected to remain unchanged during the forecast period. Regarding the examination ratio (the number of examinations divided by number of entrants into the first year three years earlier), two different assumptions have been made; in alternative A the ratio corresponds to the average during the 1998 – 2000 period and in alternative B corresponds to 1996 year's ratio. The latter alternative is due to the change in the curriculum between

---

[1] The purpose of 'Långtidsutredningarna' (the long-term projections) is to provide a basis for economic policy. A central task is to analyse long-term challenges and possibilities for the Swedish economy and their implications for economic policy.

[2] A new occupation register is being developed that will allow for identification on education groups by occupation.

1996 and 1997, which resulted in a significant drop in the examination ratio as a result of higher examination requirements. Alternative B has been employed for the calculations of the future supply of labour from different education categories, since it was found most reasonable to consider those attending all three years as upper secondary school educated rather that merely compulsory school educated.

The number of entrants into higher education leading to a professional graduate and entrants divided by subject groups are, with a few exceptions, assumed to be the same as during 2000/2001. Among the exceptions we find education for physicians and nurses, which are based on the proposals to increase the capacity for these education. The assumptions regarding examinations ratios for vocational programmes within higher education are partly based on follow-up surveys of students during previous years and partly on a series of simple quotas between the number of examinations and the number of entrants in relation to average duration of the programme. The same procedure as for vocational programmes is applied to estimate the examinations ratio for more general higher education degrees (bachelor's and master's degrees). Here, account has also been taken to that one person may graduate with more than one degree. Students completing at least one full time semester of studies area are also taken into account in the forecasts. The assumption is that the number will remain at the same level as during 1999/2000.

Studies within municipal adult education, including Adult Education Initiative (AEI) are only included if they raise the education level of the participant. These calculations are rather rough estimations based on the share of students in AEI 1988-1998 raising their education level. Due to decreasing entrants into adult education and the proposals to reduce the budgetary allocation for this type of education after the pilot period of Adult Education Initiative is over, the number of participants are expected to decrease by 5.000 persons annually down from 40.000 to 25.000 and then stay at this level during the rest of the forecast period. The assumptions regarding participants in advanced vocational education is based on the Government decision on the number of full time places for this type education during 2002. The distribution between sexes, age groups, and programme focus is expected to correspond to the average during the pilot period. (1996-2001). Other education in addition to those mentioned above include the adult colleges 'long term' courses, labour market training outside the general education system, as well as a number of post upper secondary education. Examples of education within other education are police training, private education within the field of economics and recreation instructor education at the adult colleges. With the exception of police training, where there is a planned increase in the capacity, other education is assumed to remain unchanged during the forecast period. These calculations are relatively uncertain but the number of persons within these types of education is small, which implies that that the impact on the whole forecast is small.

The former education of the persons with recent examinations is calculated in two steps. Firstly assumptions are made about the share of the population – by age groups and education groups – that will change/increase their education during the year. This provides a preliminary number of further educated persons classified by prior education. This number is then converted into a relative share by examination within each 1-year age class for men and women separately. In the next step the total number of freshly educated are multiplied with this relative distribution, which provides the number of new examinations by previous education. The calculations assume that the share of persons engaged in further education to be the same as between 1999 and 2000.

The number of emigrations and immigrations are collected from Statistics Sweden's population forecast. The immigrant's distribution between education are expected to be the same as the education immigrants between 1998 and 1999 had in 2000 according to Statistics Sweden's register of the population's education (UREG). The emigrants' distribution between education fields is expected to be the same as those emigrating during 1997 and 1998 due to availability of relatively reliable and complete data. The calculations of the availability of educated on the labour market are based on relative employment figures computed from Statistics Sweden's employment register (RAMS 1999). Relative employment figures refer to the share of the population (by age and sex in 1-year age classes and by education categories), which according to RAMS were either employed or received out-of-work income compensation.

1.2 Forecasts by the National Labour Market Administration (AMV)

The starting point in the qualification need studies by AMV is the supply and demand for qualifications by type of occupation. Overall purpose is to promote economic growth and prevent unemployment. The publications on labour market projections from AMV can be divided into short-term and long-term forecasts. The former are carried out regularly and they constitute the basis for planning of labour market policies. The latter are ad-hoc projections highlighting necessary changes within the general education system e.g. concerning education dimensions.

Short-term forecasts

It is the County labour boards and the local public employment services that carry out the central short-term forecast activities within the AMV based on AMS guidelines. The forecasts consist of a general judgement of the personnel needs the following year and more detailed analysis of specific current problems. The counties should also investigate problems related to recruitment and bottle necks, describe the reasons why the companies have problems in recruiting labour, and submit potential

solutions for discussion. The County labour board forecasts are carried out twice every year, once in spring and once in autumn. They are developed on the basis of data from the local public employment offices (Af) and special questionnaires to all firms in the region with more than 100 employees. The data also includes the municipalities, the county councils, and a selection of private firms with more than 5 employees. In total, the survey comprises around 10.000 employers. Answers from private firms are collected through telephone interviews and personal visits whilst the public sector replies are sent out by post.[3] The questionnaire to the private firms is significantly more detailed and includes questions regarding market trends, capacity utilisation, employment development during the previous year, and judgements regarding the expected development in the next two years. The employers are requested to separate between employment changes as a result of new recruitment and replacements, during the previous 12 months as well as during the forthcoming 6 and 12 months. The information about the previous 12 months provides the PES offices with information concerning the type of problems experienced when attempting to recruit new personnel, the solution to the problem and its implications. The information about the forthcoming period offers an indication of occupations where the firms plan to employ personnel, the expected number, and what qualifications they require. Additional complimentary information includes informal data that the Af and the County labour boards gathers through ongoing contacts with employers, trade union representatives, and representatives from the enterprise sectors. In parallel, the employment offices make a judgement of the supply of employment seekers within 200 different occupations. The regional forecasts results are published by the County labour boards for each county twice every year.

The report series 'Where are the jobs?' is one of the regular AMS forecasts on national level based on the forecast activities carried out on regional and local level. The demand development and the recruitment situation for a selection of occupations are diagnosed with the employers' expected recruitment needs as a starting point. Subsequently, demand and recruitment are related to the local employment offices' forecast of suitable job seekers and employment forecast for the occupations. The fact that the information on aggregated national level is based on information collected locally and regionally implies that there may be bias in the national results. The report is published twice per year in which the main forecasts results are reported as a change in the number of employed by occupation/branch and as a shortage index. It also includes information about the trends within labour market training.

The shortage index published in 'Where are the jobs?' has been developed by AMS to identify occupations where there is a shortage of suitable applicants. It is a weighted average of the local labour market offices' judgements regarding a certain occupation. The index scale is between 1 and 5 where 1 corresponds to significant

[3] These surveys are also used as reference information for the reports 'Where are the jobs?' and 'Labour market outlooks'.

excess and 5 significant shortage. The figure for a certain occupation is derived by multiplying the number of employment offices estimating significant excess for a certain occupation by 1, the number of employment offices estimating excess is multiplied by 2, etc. and the sum of the products is then divided by the number of employment offices. In practice, this type of analysis easily leads to underestimations of problems related to excess, which implies that index numbers below 3 are relatively few and the average for all occupations in 2002/2003 was 3,37. The National Labour Market Board classifies occupations with an index equal to or above 4, as a shortage in the whole country. Indexes ranging between 3,6 and 3,99 are considered as occupations with significant shortages in parts of the country and shortages or balances in other parts of the country. Occupations in the index interval between 3,2 and 3,59 are characterised by some shortage or balance in most parts of the country. Indexes between 2,8 and 3,19 refer to occupations where there is balance between demand and supply whilst figures below 2,8 indicate an excess of labour.

In the report series 'Labour market outlooks' the AMS presents an overview situation of the labour market in a general perspective. The reports are published with a six months interval and refer to the outlooks during the following year. The reports focus on discussions about the trends, developments and forecasts regarding different industry sectors. They contain detailed information explaining the reasons behind recent trends, the current situation, its consequences, and responses in terms of labour market programs. In addition to the forecast activities undertaken at regional and local level, 'Labour market outlooks' provides information about other internal AMS studies as well as projections by Statistic Sweden and other actors.

Long-term forecasts

The points of reference concerning the demand for labour in the AMS long-term forecasts are the expected leaves into retirement (according to current flow structures) and assumptions regarding employment need trends. Labour market policy programmes are not included in the analyses since it is considered outside the scope of labour market policy to provide education/training correcting for long-term supply shortages. The needs to increase or decrease the number of employees are reported by sector and/or occupation. Due to the fact that it is a long process to change education dimensions and, more so, attitudes towards occupations, the reports employ a relatively long forecast perspective. The material for the reports are collected from Statistics Sweden (LFS, population and education statistics, etc) the local PES offices, the AMS labour market statistics on jobseekers, the national institute for education, and complimented by interviews with branch organisations and a wide range of employers.

The AMS does not carry out any regular long-term forecasts but last year (2002) the AMS started a to publish a series of analyses highlighting future sector specific

personnel supply trends until 2015. These reports focus on occupations or branches where staff shortages have been identified and so far three sectors have been addressed: health care[4] (AMS 2002b), construction (AMS 2002d), and teaching (AMS 2003c). The intention is to continue with other occupations/branches where indications of labour shortages are visible. AMS also publishes ad-hoc prognoses of long-term supply and demand trends on occupational level. The most recent describes the necessary outflow from education during the period 1998 to 2010 in order for the future labour market demand to be matched. This report also highlights the occupations were there may be a future shortage of labour during the first years of the new millennium. (AMS 1998)

1.3 Forecasts by Other Actors

There is a wide range of actors engaged in forecasts and personnel projections, ranging from public education and training coordinators to private branch organisations. The purpose here is only to mention some of these organisations and their contributions in terms prognoses of qualification needs. This could be considered as an indication of the type of information available as a compliment to the projection work undertaken within SCB and AMV.

Forecasts from a business perspective

The Swedish Business Development Agency (NUTEK), is Sweden's central public authority for industrial policy issues assigned with the task to promote sustainable growth throughout the country. NUTEK is also engaged in projecting labour market trends, which are frequently mentioned in the discussion concerning future qualification needs. 'Utbildning för sysselsättning eller arbetslöshet' (Education for employment or unemployment) published in 1999, presents a judgement of the qualifications required by the business sector until 2010, in order to maintain current growth. The estimated demand is presented as a share of the total labour force. NUTEK puts business life developments in focus, the calculations refer to relatively aggregated education groups and highlight some groups that are important within the export industry, and the public sector is left outside the model. The trends regarding labour demand are based on statistics from Statistics Sweden.

The Confederation of Swedish Enterprise represents 48 member associations and approximately 57.000 member companies with more than 1.5 million employees. The confederation's assignment from its member companies is to enhance the understanding of companies' reality and to work for the best possible conditions for all companies in Sweden to operate and grow. Swedish Enterprise publishes ad-hoc

[4] Health care comprises of health, dental care and support service sectors

reports with the objective to improve the understanding of requirements and demands on tomorrow's labour market from the perspective of private employers. The majority of studies are based on interviews with the member companies. The Confederation of Swedish Enterprise (2001b) presents a study composed of three separate parts. The first part was an inventory of the supply from education with focus on business administration, economics, technology, and inter-disciplinary IT training, and it compares 1991/92 and 2000. A quantitative analysis of the demand for higher educated labour within IT/telecom and traditional industry, based on telephone interviews with 300 company managers, constituted the second part, and thirdly, there was a workshop with representatives from different companies, discussing requirements, needs and desires.

Industry sector specific personnel projections

The National Agency for Education (NAE) is responsible for the Swedish work with personnel prognoses for childcare, schools, and adult education. Statistics Sweden, commissioned by the NAE, collects the data. There is also and a reference group, with a broad representation from the Swedish Association of Local authorities, the National Agency for Higher Education, the teachers' unions, some universities and university colleges, and a few municipalities, connected to the work. Over the years that the NAE has been responsible for the work, prognoses for a number of personnel categories have been made. These prognoses have been presented in various publications. The first prognoses were comprehensive and the more recent more specific.[5] They are carried out according to essentially two main aspects. The first part is concerned with calculating the teacher demand, which in turn is divided up into total demand, recruitment demand, and graduation demand. The second aspect calculates the teacher supply; with the assumption that today's dimensions of teacher training will remain the same in the future. By comparing the estimated teacher demand and supply, a picture emerges of the balance situation in the future. The first point of comparison between demand and supply lies 5 years into the future. The basis for the NAE teacher prognoses is provided by a directory of teaching staff providing essential basic information about the existing teaching corps in the form of gender and age composition. This makes it possible to calculate how long teachers stay in the profession and the percentage of newly graduated teachers who begin to work as teachers. The main users of the prognoses are the Ministry of Education and Science, the universities and university colleges with teacher training programs, and the municipalities.

[5] Teacher shortage or teacher surplus? (1996), The need to educate teachers in general subjects (1996), Teachers in special schools for the mentally handicapped (1997), The need to educate teachers in vocational subjects (1998), Teachers in primary-secondary school and in practical and artistic subjects in upper secondary school (Report no. 151, 1998), Preschool teachers and after-school instructors. (1998), Teachers in upper secondary schools and upper secondary adult education (2001)

The Swedish Federation of County Councils represents the Governmental, professional and employer-related interests of its members – the county councils. The county councils are responsible for matters of common interest, which are too extensive and too costly for individual municipalities to manage. This mainly concerns health care, which is the county councils' major task, but also some other areas[6]. The federation carries out personnel forecasts for the heath care sector with a couple of years' interval. The most recent report was published 2001 and the forecast period extends over 2010 (Landstingsförbundet 2001). The purposes are to analyse the interest for certain education and the need for education places from a national perspective. The forecasts are based on current personnel data and assumptions about future recruitment possibilities.

The Swedish Association of Local Authorities is an association of Sweden's 289 primary local authorities. The municipalities in Sweden are legally responsible for issues such as social services, which include childcare, care of the elderly and social security benefit matters, the school system, and health and environmental care. Since 1996 the association has published several reports addressing the recruitment need within the municipal sector, but two studies published within the report series 'The municipalities and the personnel', stand out as the main ones. The first of them is a study from 1996 forecasting the gross personnel flows between 1996 and 2005. The second, published in 1998, is an in depth study of the situation within the most personnel intensive activities until 2010. The estimations are based on calculations of recruitment and education needs and the attractiveness of the municipalities as a work-place. The calculations in the most recent publication are based on a long-term projection prepared by the association in 1998, which uses SCB population statistics.

[6] Dental care, public transport, culture, higher and upper-secondary education, tourism, the environment, support for business and industry and regional growth and development.

Table 2: Summary of recent forecasts accounted for in this report

Fores by Statistic Sweden and National Labour Market Administration

Regular forecasts						
Actor	Publication	Frequency	Main reference information	Most recent publication	Forecast period	Type of information
SCB	Trends and forecasts	Every 3rd year	Population and Labour force survey, projections of economic trend, etc	May 2002	2020	Supply and demand (stocks) for 50 education groups
SCB	Education and the demand for labour	Every 3rd year	Population and Labour force survey, projections of economic trend, etc	January 2001	2008	Supply and demand (flows) for 50 education groups
SCB	Labour Market Tendency Survey	Annually	Questionnaire to 7600 employers	December 2002	2005	Outlooks for 74 education groups
AMS	Where are the jobs?	2 reports per year	Interviews with 10.000 employers	February 2003	2003	Supply and demand by occupation
AMS	Labour market outlooks	2 reports per year	Interviews with 10.000 employers	August 2002	2003	Sector outlooks; Labour supply and demand trends
County labour boards	Labour market forecasts	2 reports per year	Interviews with 10.000 employers	Spring 2003	2005	Regional labour market trends

Ad-hoc forecasts					
Actor	Publication	Main reference information	Publication year	Forecast period	Type of information
AMS	The jobs of the future'	Population and Labour force survey, interviews, etc	1998	2010	Necessary outflow from education in order to match future demand
AMS	(Series of sector specific forecasts)	Population and Labour force survey, interviews, etc	2002 -2003	2015	Sector specific personnel supply trends within construction, health care, and teaching

Forecasts by other actors

Growth/business perspective		
Actor	Main reference information	Type of information
NUTEK	SCB data, assumptions regarding future qualification requirements. etc	Business sector qualification demand on aggregated education group level
Confederation of Swedish enterprise	Interviews and surveys among the confederation's member companies	Analysis if the requirements and demands on tomorrow's labour market
Personnel projections		
NAE	SCB data personal statistics, assumptions regarding future qualification requirements, etc	Personnel prognoses for childcare, schools, and adult education
The Swedish Federation of County Councils	SCB data personal statistics, assumptions regarding future qualification requirements, etc	Recruitment need within the county council sector
The Swedish Association of Local Authorities	SCB data personal statistics, assumptions regarding future qualification requirements, etc	Recruitment need within the municipal sector

1.4 Availability of Reference Statistics

This section accounts for the availability of relevant reference statistics from Statistics Sweden. This serves to highlight the potential for analyses of education and labour market flows and reliable forecasts in Sweden.[7]

Survey-based statistics

Arbetskraftsundersökningarna – AKU (Labour Force Survey – LFS)

The first Swedish Labour Force Surveys (LFS) was carried out in 1959 and since 1970 they are carried out every month with the aim to describe current employment situations and to provide information about labour market developments. Since 1995, there is also an EU-adjusted LFS, which since 2001 is carried out monthly with quarterly reporting. The EU-LFS refers to household as opposed to individuals in the Swedish LFS. The survey population has increased from 16.000 in 1970 to 22.000 in July 2001. The most recent increase allowed for enhanced regional coverage and extended target population to age groups between to 15-74. As from 1997 occupation is classified according to Standard för Svensk Yrkesklassificering (SSYK)[8]. Industry sector refers to the activities of the work place where the person is employed, and as from 1995 the classification is made according to Standard för Svensk Näringsgrensindelning 1992 (SNI92).[9] The individuals are also classified by sector (state, municipal, and private) according to a harmonised reporting of the company sector. The information is mainly collected through telephone interviews undertaken by Statistics Sweden, and the monthly results are published two weeks after the end of the reference period (calendar month).

Personalutbildningsstatstik (Staff training statistics)

Staff training statistics provides information about the labour force in terms of further education, competence, and occupation. The survey is carried out as a compliment to the LFS, twice per year, and the statistics measure the amount and contents of staff training during the past six months. The survey population comprises 13.000 employed persons, and the data collection is made through computer based telephone interviews. The staff training measured in the survey is fully or partly financed by the employer. The classification allows for a breakdown into five labour

[7] The information is based on descriptions of the statistics, available online at: www.scb.se/statinfo/pblomr.asp

[8] The Swedish version of ISCO 88 COM

[9] The Swedish version of NACE

market sectors[10] and 18 different course subjects (including one 'other' category). In addition, it is possible to identify volume/duration, provider, whether the training was provided on working time, and two different classifications by type of training; firstly based on whether it was supervised, seminar, conference, etc. and secondly, whether it was company specific, general, or partly company specific. Note that the statistics exclude guidance at the workplace and other workplace learning, which implies that it underestimates the actual competence building, taking place at the work places.

Inträdet på arbetsmarknaden (Entering the labour market)

The first survey under the name 'Inträdet på arbetsmarknaden' was carried out in 1996*,* and the 2002 survey was the fourth in order. It is based on prior follow-up surveys of upper secondary school and higher education. The comparability between these independent surveys was low for several reasons but recent co-ordination provides a common survey with improved comparability. The aim of the survey is to shed light on the labour market from different aspects, and to describe the entrance int1o the labour market for persons with different educational backgrounds. The survey is carried out every second year, three years after completing education, through a common questionnaire sent out by post to a selection of approximately 13.000 students leaving upper secondary and higher education and a follow-up by telephone. The questionnaire includes questions about employment, occupation, sector, industry sector, working time, and wage.

Konjunkturstatistik över vakanser – KV (Trend statistics on vacancies)

Trend statistics on vacancies is a company-based survey initiated during the third quarter 2000. The objectives are to contribute with information about the labour market demand, and to present information about the whole labour market. Information regarding the private sector is collected through a monthly questionnaire sent out by post to 19.500 work places. The public sector comprises of a selection of 5.500 work places, of which those with more than 500 employees are studied in full detail. The variable on the number of job openings is divided into filled and non-filled job openings. 'Vacancies' are defined as non-filled vacancies that are immediately available for job seekers. Thus, the variable measures unsatisfied demand for labour in the same way as the number of unemployed in the LFS measures the unsatisfied supply of labour. The degree of recruitment is defined as the number of job openings as a share of the total number of employed in the same reference group. The degree of vacancies is defined as the number of vacancies as a share of the total number of employed in the same reference group. The reporting is made by sector, industry sector, size and region, and the results are presented on a quarterly basis

[10] Independent, employer, state, county council, and municipal

Kortperiodisk sysselsättningsstatistik (Short-term employment statistics)

Short-term employment statistics is a company-based survey comprising 5.800 public and 19.500 private workplaces. The statistics offer a swift instrument to indicate changes in the number of employed by detailed industry sector (according to SNI 92). A secondary aim is to demonstrate changes in the total number of employed on national as wells as county level. A third variable included in the survey is personnel turnover. The survey is carried out monthly with quarterly publications.

Register-based statistics

Den registerbaserade arbetsmarknadsstatistiken – RAMS (Register based labour market statistics)

The register based labour market statistics aims to provide annual information about employment, commuting, industry sector structure, personnel structure at work places, and to highlight developments and flows on the labour market from a longitudinal perspective. The first version referred to 1985 and it is currently available until 2000. The statistics are mainly based on the information from employers that links individuals to companies and work places. This allows for reporting of individuals by detailed education level, region (county, municipality, part of municipality) branch (5-digit SNI code), sectors, company size, etc. In addition, the companies can be described by the characteristics of the employees (e.g. sex, age, and education).

Befolkningens utbildning (The population's education)

The statistics on the population's education describes the highest level of education of the population in Sweden according to Svensk utbildningsnomenklatur (SUN 2000).[11] It is based on the individual register in daily speech called UREG, which is a state register from 1985 with annual updates. The population comprises persons in the age groups between 16 and 74 registered in Sweden. The statistics is employed as a basis for educational planning on national and regional level as well as for international comparisons. Annual co-ordination with RAMS provides information about the education situation in different parts of the labour market. Examples of registers used as reference are the register of student from the National Agency for Education, universities and high schools, and the National Labour Market Board's job seeker register. The statistics refers to the whole population, which allows for analysis of detailed groups, such as municipalities or even parts of municipalities by sex, age, education level, and education focus.

[11] The Swedish version of ISCED 1997

Persons born outside Sweden attending foreign education, military service, staff training, and adult college education is not fully covered. A survey including 60 000 persons born outside Sweden for whom information was missing, was carried out in 1999 and the versions from 2000 and onwards have been updated with this information. As from 1999 the survey of persons born outside Sweden is annual and comprises persons in the age groups between 20 and 59 who has registered in Sweden during the year. The register also includes military training and adult college education offering the general admission requirements to higher education since 2003.

Befolkningens studiedeltagande (The population's participation in education)

The register provides the basis for statistics describing the population's (16-64 years) participation in the regular education system. It is applied, among other uses, to delineate the distribution of education among the population by age, sex, and regions, as well as to produce statistics of the student's labour market status and income situation. The first version of the register was produced in 1992 and the information is organised annually every autumn semester. The information covers students in regular Swedish upper secondary education, municipality adult education, university and university college education, technical foundation year, advanced vocational training, students at adult colleges engaged in the Adult Education Incentive and other persons receiving study allowance from the Swedish Central Agency for Study Allowance (CSN). Some general education such as compulsory education and some adult college education are excluded, as is labour market training, Swedish for immigrants, and Särvux[12].

Longitudinellt register för utbildnings- och arbetsmarknadsstatistik – LUCAS, 1990-1999 (Longitude register for education and labour market statistics)

LUCAS describes activity after education, entrance and establishment on the labour market for students having completed different levels of education. It is a new register with annual updates providing statistics for the product 'Verksamhet efter Utbildning' (Activity after Education). The database comprises all individuals between 16 and 64 years with information on completed education or participation in training as from 1989/90 until 1998/99. The register allows for the identification of activity in terms employment, studies, not registered in Sweden, and a category for other. The information further provides information about activities after education by industry sector, sector, and income. The statistics is reported by education level, education focus, sex and region.

[12] Särvux is a form of education for mentally disabled adults seeking to compliment their education.

Gymnasieungdomars studieintresse (Interest for studies among students in upper secondary education)

The aim of the survey regarding the interest for studies among students in upper secondary education is to draw attention to the development of interests for studies over time. It covers a very small share of total supply of educational statistics, and should be considered as a compliment to the register statistics about the transition from upper secondary education to higher education. Statistics Sweden carried out the first investigation in 1992 among students in the final year of upper secondary education 1992/93, and since then, the survey has been carried out annually every autumn. The survey is based on a questionnaire sent out by post to 3.200 students[13] selected from the National Agency for Education's student register. The questionnaire includes information about county and municipality as well as questions concerning the interest for studies within higher education, preferred university or university college, and most attractive education focus. The most important variable refers to interest for higher education studies within the next three years. The result from this question and a number of related questions are reported by sex, selected upper secondary education programmes, and certain regions.

2 Mismatches and their Implications

This first part of this section presents some principal results from recent qualification need projections in Sweden, in particular projections indicating shortages of certain qualifications. The other side of the mismatch problem i.e. the excess of certain types of education is not highlighted below. This is related to that the report focuses on the mismatch problem in terms of recruitment problems rather than unemployment. The second part in this section accounts for some results from studies analysing the consequences of recruitment problems on the Swedish labour market.

2.1 Presentation of Forecast Results

The purpose is not so much to account for the qualification need situation on the Swedish labour market as to demonstrate how the results are presented and to shed light on a few industry sectors where (risk for) shortages have been identified. This serves to acquire an insight into the type of information available for the actors within the system of qualification supply. One general observation is that although the forecasts tend to project shortages within the same occupations/education, the dimensions sometimes vary significantly.

[13] The selection may larger due to specific regional assignments (10.214 students in 2002).

General trends

'Trends and forecasts' (SCB 2002) projects that the risk for a general shortage of labour is relatively low, and the problems are more likely to be found regarding imbalances between education groups. Table 3 demonstrates that significant shortages are projected for e.g. different teacher groups, upper secondary education within the fields of economy, technology and caring, and various groups within the health care sector. The table also shows great variations between different groups of teachers; while there is a projected shortage of several teacher groups, there is an excess of subject teachers (forms 4-9) in 2020 amounting to between 33.500 (alternative A) and 34.600 (alternative B) teachers, which corresponds to 72 / 76 percent of the total demand for this group of teachers until 2020.[14]

The prognoses presented in 'Education and the demand for labour' (2001) is somewhat more uncertain regarding to what extent the labour reserve could satisfy further qualifications needs. On the basis of a moderate employment growth assumption, the present labour reserve would shrink from 350.000 to 100.000 persons by 2008. This implies that the labour market will face even more serious problems of shortages in a few years time if labour force participation does not increase. 'Education and the demand for labour' also underlines the uneven regional distribution of the labour reserve. Concerning the general imbalances between education groups, the excess in the supply of labour with primary education is expected to be high whilst there will be a shortage of various types of higher education. Table 4 includes a selection of the projections presented in 'Education and the demand for labour'. The first two lines indicate an expected excess of labour with 'Folk- and compulsory school education' and 'Upper secondary education' is significant. The outflow of labour with upper secondary education during 1999-2008 exceeds the recruitment need by 44.300 individuals, which corresponds to almost 30 percent of the total recruitment need during this period. Taking into account the existing labour market reserve, the excess of labour within this group will reach 60.900 individuals in 2008. Nevertheless, table 4 also indicates that there are exceptions to this trend e.g. the recruitment need for economists with upper secondary education exceeds the outflow by close to 20.000 individuals, which implies a labour shortage of 13.300 in 2008.

The 'Labour Market Tendency Survey' reveals that the share of employers seeking new personnel decreased by four percent to 49 percent between 2000 and 2001. At the same time, there was an increase in the number of applicants. Nevertheless, the survey forecasts a significant shortage of experienced as well as recently graduated personnel in more than half of the 77 occupational groups. Only six of the educational groups show a good supply of applicants with occupational

[14] In alternative A the education structure is assumed to develop at the same rate as during the 1990s and in alternative B the rate is assumed to be half as fast as during the 1990s.

experience[15] and there is a shortage of non-experienced qualified staff in 30 of the educational groups. Table 5 includes a selection of the results presented in the 'Labour Market Tendency Survey 2002'. The sample is focused on occupations where the employers experience labour shortages i.e. cases where the difference between the share of employers indicating 'good supply' and 'shortage' exceeds 20 percentage points. One of the most extreme examples is the situation for dispensers, where none of the employers indicated 'good supply', neither for 'graduates' nor for 'experienced', whereas 94 percent indicated a shortage of 'graduates' and 81 percent a shortage of 'experienced'. Other extreme cases include the shortage of 'experienced' physicians and nurses. The employers also estimate that the need for personnel will increase for slightly more than half of the 77 educational groups in one year and for nearly 90 percent within the next three years. The occupations where a significant share of the employers expect the long-term needs to increase include engineering graduates, VVS educated, physicians, nurses, specialist teachers and restaurant educated.

'Where are the jobs' (AMS 2002h) highlights that reduced recruitment problems do not apply to public employers, which still have – and will continue to have – difficulties to find qualified labour. Table 6 presents selected results from 'Where are the jobs 2003' and it can be seen that occupations within the health care and teaching sectors dominate the top part of the table, which is sorted after the index figure from 2002 spring. All the occupations included in the table were experiencing significant shortages in at least parts of the country during spring 2002 (index 3.6 – 3,99), and 18 of them were experiencing shortages in the whole country (index >3,99).

In general, the recent labour forecasts suggest that the main exception to the generally diminishing recruitment problems is several professions in the municipality sector requiring higher education qualifications such as nurses, physicians, pharmacist, teachers, etc. In addition, there is a significant shortage of some professions requiring upper secondary education, such as assisting nurses and personal assistants. Other areas are concentrated to occupations demanding technical qualifications. In the long run there is also a warning for shortages within the construction sector. 'Where are the jobs 2003?' states that the education system has not adopted its dimensions to the expanded needs for these types of labour, which will bring recruitment problems within a range of occupations. This means that the downturn in employment growth due to the weak industry trend could be made even weaker due to qualification shortages.

[15] These education groups are administration, computer programmers/systems analysts, biologists, social scientists, lawyers, and upper secondary school teachers of history and social sciences.

Table 3: Selected results from 'Trends and forecasts 2002' (thousands)

Education	Supply 2020	Demand 2020		Excess/Shortage			
		A*	B*	A*	B*	A* (%)	B* (%)
General education							
Folk- and compulsory education	450,9	0	367,5	450,9	83,4	-	23
Upper secondary education	2247,2	2448,4	2303,5	-201,2	-56,3	-8	-2
Higher education	1745,4	1833,3	1603,2	-87,9	142,2	-5	9
Pedagogical education							
Upper secondary education	3,3	3,4	3,0	-0,1	0,3	-3	10
Post-upper secondary education							
- Pre-school teachers	57,9	112,6	99,8	-54,7	-41,9	-49	-42
- Recreation pedagogues	21,7	29,1	24,1	-7,4	-2,4	-25	-10
- Compulsory school and special teachers	63,5	66,6	66,2	-3,1	-2,7	-5	-4
- Subject teachers (forms 4-9)	79,9	46,4	45,3	33,5	34,6	72	76
- Practical and arts teachers	19,2	26,2	26,5	-7,0	-7,3	-27	-28
- Vocational teachers	9,6	22,2	21,2	-12,6	-11,6	-57	-55
Economics and Social Science education							
Upper secondary education							
- Economists	74,5	130,1	133,0	-55,6	-58,5	-43	-44
- Trade and administration	233,0	221,4	256,8	11,6	-23,8	5	-9
Post-upper secondary education							
- Economists	130,2	98,7	81,4	31,5	48,8	32	60
- Lawyers	34,7	35,0	30,1	-0,3	4,6	-1	15
- Soc./Behavioural Science	30,3	36,1	34,5	-5,8	-4,2	-16	-12
Natural Science							
Upper secondary school	18,1	14,4	12,9	3,7	5,2	26	40
Post upper-secondary education							
- Natural science, etc. (without a degree)	48,6	55,8	40,4	-7,2	8,2	-13	20
- Programmers/system analysts	56,8	34,7	33,7	22,1	23,1	64	69
- Natural scientists	53,0	35,3	33,7	17,7	19,3	50	57

Technology and manufacturing							
Upper secondary education							
- Technology programme (2-3 years)	22,0	62,5	89,1	-40,5	-67,1	-65	-75
- Construction	125,6	145,5	127,5	-19,9	-1,9	-14	-1
- Electronic / computer	160,6	183,2	160,6	-22,6	0,0	-12	0
- Vehicle and transportation	108,8	110,9	95,1	-2,1	13,7	-2	14
- Energy and VVS**	25,9	37,7	32,8	-11,8	-6,9	-31	-21
- Manufacturing	144,6	154,9	151,0	-10,3	-6,4	-7	-4
Master degrees							
- Road and water	17,8	19,9	17,7	-2,1	0,1	-11	1
- Electronics, etc.	38,5	36,7	31,6	1,8	6,9	5	22
- Machinery, etc.	53,4	37,5	34,4	15,9	19,0	42	55
- Chemistry, etc.	18,5	15,4	13,4	3,1	5,1	20	38
Engineering graduates (including 4th year of upper secondary education)	118,5	137,8	129,2	-19,3	-10,7	-14	-8
Health care							
Upper secondary education							
- Child and recreation	79,6	115,7	99,5	-36,1	-19,9	-31	-20
- Caring	134,9	344,5	307,0	-209,6	-172,1	-61	-56
Post upper secondary education							
- Bio-mechanic analysts	7,4	15,6	15,3	-8,2	-7,9	-53	-52
- Recreation instructors	15,2	15,8	14,3	-0,6	0,9	-4	6
- Physicians	28,1	39,9	39,7	-11,8	-11,6	-30	-29
- Nurses	116,8	156,7	141,5	-39,9	-24,7	-25	-17
- Social workers	30,7	43,0	35,6	-12,3	-4,9	-29	-14
- Dentists	4,6	10,3	10,5	-5,7	-5,9	-55	-56
Hotel and restaurant	103,1	75,4	65,8	27,7	37,3	37	57

* See sub-section 1.1.3
** Heating, ventilation, and sanitation
Source: Statistic Sweden 2002b

Table 4: Selected results from 'Education and the demand for labour 2001' (thousands)

Education	Employed 1998	Outflow			Recruitment need			Balance 2008
		99-03	04-08	Sum	99-03	04-08	Sum	
General education								
Folk- and compulsory	778,6	72,8	67,6	140,4	73,9	60,1	133,9	72,1
Upper secondary	229,8	102,1	96,9	199,1	85,2	69,7	154,8	60,9
Pedagogical education								
Child /recreation educated	98,3	26,2	23,6	49,7	28,3	29,4	57,7	-3,3
Recreation instructors	11,1	3,2	3,1	6,4	3,9	3,5	7,4	-0,5
Recreation pedagogues	17,0	3,0	3,1	6,1	5,3	5,8	11,1	-4,7
Pre-school teachers	67,8	6,9	6,6	13,5	15,0	20,2	35,3	-20,8
Compulsory school teachers	67,2	17,8	18,6	36,3	27,1	24,0	51,2	-14,4
Subject teachers	34,0	4,9	6,8	11,6	4,3	3,7	8,0	3,9
Vocational teachers	17,2	1,5	1,7	3,1	5,0	4,6	9,6	-6,2
Economics and Social Science education								
Trade and administration	275,0	37,0	33,1	70,2	48,0	39,0	87,0	-0,2
Upper secondary economists	143,7	37,8	35,1	72,9	52,1	40,6	92,7	-13,3
Higher education economists	52,7	15,8	16,9	32,7	21,2	17,5	38,7	-4,9
Lawyers	20,8	5,1	4,6	9,7	6,6	6,6	13,2	-3,0
Social workers	24,1	4,3	5,1	9,4	6,3	6,9	13,2	-3,4
Programmers/syst. analysts	17,7	2,3	2,4	4,7	7,4	6,2	13,6	-8,4
Soc./behavioural Science	44,4	10,2	11,1	21,3	11,3	10,1	21,4	1,1
Technology and Natural Science								
Upper secondary education								
- Technology programme	118,2	12,7	12,1	24,8	19,1	14,7	33,9	-5,6
- Construction	72,2	10,4	12,2	22,6	19,2	13,0	32,2	-1,9
- Electrician	104,0	23,3	24,7	48,1	29,3	21,5	50,9	2,4
- Energy and VVS *	21,0	4,1	3,6	7,7	4,9	3,6	8,5	0,7
- Vehicle	62,9	18,2	19,3	37,5	14,7	10,7	25,4	16,7

- Manufacturing	119,7	11,9	8,8	20,7	20,4	15,2	35,6	-2,5
- Engineers	81,3	3,9	3,6	7,5	12,8	9,9	22,8	-13,3
Master degrees								
- Road and water	10,0	2,5	2,7	5,2	3,8	3,0	6,8	-1,5
- Electronics, etc.	20,7	7,4	8,0	15,4	10,0	8,5	18,5	-3,0
- Machinery, etc.	18,8	5,6	6,0	11,7	9,0	7,4	16,4	-4,6
- Chemistry, etc.	8,0	2,8	3,4	6,2	2,5	2,1	4,5	1,8
Natural Scientist	23,8	7,5	8,2	15,7	7,4	6,8	14,2	2,1
Engineering graduates	18,3	13,6	14,2	27,7	14,8	11,8	26,6	1,7
Transport and communication								
Upper secondary education	53,5	2,2	1,8	4,1	6,5	4,7	11,2	-4,4
Higher education	9,4	2,2	2,5	4,7	0,8	0,5	1,3	3,5
Health care								
Caring education	187,7	28,1	25,3	53,5	51,0	50,7	101,7	-42,5
Occupation therapist	7,0	1,9	1,8	3,8	2,8	3,0	5,8	-1,9
Physician	29,1	3,5	3,4	7,0	6,7	7,3	14,0	-6,8
Physiotherapist	10,7	2,2	2,2	4,4	3,7	4,0	7,7	-3,1
Nurse	95,5	22,4	25,8	48,2	35,3	38,3	73,5	-24,3
Social service	8,6	2,9	3,0	5,9	3,4	3,4	6,8	-0,7
Dentist	8,2	0,7	0,7	1,4	1,1	1,2	2,3	-0,7
Hotel and restaurant	45,1	22,7	24,8	47,4	14,2	11,3	25,5	26,3
All **	**3849,2**	**777,0**	**769,9**	**1546,9**	**919,7**	**786,7**	**1706,4**	**64,4**

* Heating, ventilation, and sanitation

** Includes all education groups in the forecast and not only those included in the table.

Source: Statistic Sweden 2001

Table 5: Selected results from 'Labour market tendency survey 2002'

Education group	Supply of applicants				Short term needs			
	Graduates		Experienced		1 year		3 years	
	Good (%)	Shortage (%)	Good (%)	Shortage (%)	Increase (%)	Decrease (%)	Increase (%)	Decrease (%)
Engineering graduates								
- Electricity/electronics	45	41	9	64	27	6	74	6
- Building technology	23	36	1	91	54	3	73	3
Construction educated	7	49	6	82	46	5	65	9
Process educated	2	76	5	77	35	11	52	14
Wood educated	6	74	2	82	42	10	55	11
Manufacturing educated	3	86	4	94	46	7	55	21
Vehicles and transport.	7	63	2	90	42	5	54	17
Electricians	20	41	4	84	29	8	52	7
Tele/electronic educated	16	54	2	69	20	20	54	18
VVS* educated	9	72	7	87	36	2	57	3
Agriculture and forestry	3	86	6	80	22	6	44	12
Social workers	12	73	10	76	22	2	33	4
Dispensers	0	94	0	81	38	8	45	6
Physicians	3	63	0	95	36	1	46	3
Nurses (general)	3	82	1	92	46	4	57	4
Nurses (specialists)	8	71	7	77	39	3	59	5
Dental nurses	21	50	13	63	15	6	26	20
Dentists	6	82	2	92	17	8	25	10
Veterinaries	5	46	4	87	15	0	49	0
Recreation instructors	8	76	7	79	11	4	35	12
Teachers								
- Specialists	18	67	4	86	34	1	46	4
- 1-7 Swedish/Soc.Sc	20	50	6	62	7	7	24	20
- 4-9 Maths/Nat.Sc	23	55	19	66	34	2	46	9
- 4-9 Language/Soc.Sc.	21	47	3	70	14	6	35	12
Theologians	5	67	6	59	14	2	20	10
Restaurant educated	12	62	6	84	10	15	51	2
All**	**35**	**38**	**15**	**56**	**23**	**7**	**42**	**10**

* Heating, ventilation, and sanitation
** Includes all occupations in the forecast and not only those included in the table.

Source: Statistic Sweden 2002a

Table 6: Selected results from 'Where are the jobs 2003?'

Occupation	Spring 2002	Spring 2001	Spring 2000	Spring 1999
Nurse	4,58	4,63	4,53	4,41
Physicians (general)	4,38	4,46	4,29	3,99
Geriatrics nurse	4,33	4,32	4,30	4,15
School teacher (4-9, maths, Nat.Sc)	4,32	4,45	-	-
District nurse	4,27	4,29	4,15	3,94
School teacher (1-7,maths, Nat.Sc)	4,26	4,38	-	-
Physicians (specialist)	4,19	4,25	4,09	3,90
School teacher (4-9)	4,18	4,32	4,34	4,33
School teacher (4-9, languages)	4,11	4,20	-	-
VVS fitter	4,11	4,15	3,83	3,63
Emergency nurse	4,11	4,17	4,10	3,90
School teacher (1-7)	4,10	4,22	4,23	4,17
Social secretary/welfare officer	4,08	3,88	3,78	3,55
Dentist	4,07	3,95	3,58	3,21
Preschool teacher	4,07	3,90	3,47	3,43
Special pedagogue	4,07	4,16	4,06	3,83
Upper secondary school teacher (Nat.Sc)	4,02	4,26	4,24	4,17
Pharmacist	4,00	3,98	3,70	3,21
School teacher (4-9, other)	3,97	4,05	-	-
Dispensers	3,95	3,98	3,61	3,14
School teacher (1-7, other)	3,94	4,07	-	-
Installation electrician	3,93	4,23	3,92	3,53
Recreation instructor	3,90	3,76	3,51	3,50
Children's nurse	3,89	3,87	3,76	3,59
Assistant nurse	3,88	3,89	3,78	3,90
Truck mechanic	3,87	3,97	3,73	3,37
Personal assistant	3,81	3,89	3,72	3,56
CNC/NC* operator	3,80	4,10	3,98	3,80
Upper secondary school teacher (technology	3,80	4,11	4,00	-
Upper secondary school teacher (language)	3,79	4,08	3,87	3,89
Building tinplate worker	3,79	3,84	3,61	-
Chef (specialist)	3,78	3,67	3,62	3,61
Chef	3,78	3,85	3,72	3,60
Licensed welder	3,76	3,81	3,72	3,76
Speech therapist	3,73	3,65	3,47	3,41
Industry electrician	3,73	3,88	3,70	3,48
Physiotherapist	3,72	3,68	3,45	3,29
Mason	3,72	3,80	3,59	3,33
Midwife	3,71	3,63	344	3,24
Toolmaker	3,68	3,87	3,72	3,63
Car mechanic	3,68	3,76	3,57	3,16
Psychologist	3,68	3,56	3,47	3,36
Occupational therapist	3,67	3,54	3,36	3,31
Upper secondary school teacher (vocational)	3,67	3,89	3,67	3,67
Master of engineering (machinery)	3,66	4,03	3,94	3,89
Floor layer	3,63	3,68	3,43	3,23
Upper secondary school teacher (computer)	3,63	4,05	4,06	4,03
Dental hygienist	3,60	3,50	3,27	3,05
All**	**3,37**	**3,50**	**3,36**	**3,24**

* (Computer aided) Numerical Control

** Includes all occupations in the forecast and not only those included in the table

Source: Statistic Sweden 2002h

Technology and Natural Science

The 'Labour market tendency survey' reveals that the short-term problems to recruit technical staff have generally decreased. One example of this trend is the change from 'significant shortage' to 'very good supply' of persons with a university degree within Electrical Engineering, Computer Science, and Technology within only one year between 2001 and 2002. Nevertheless, employers still report a shortage of experienced staff for 75 percent of the surveyed educational groups, and a shortage of newly qualified staff for about one third of the groups e.g. 64 percent of the employers in the 'Electricity/electronics' field experience shortages of experienced labour, and as many as 91 percent within the field of 'Building technology' (table 5). 'Trends and forecast' projects that a continuation of the changes in educational structure of the personnel within different economic sectors occurring during the 1990s would lead to a shortage of labour with natural sciences/technical education. However, if the pace of structural changes were halved, the prognoses suggest a relatively good balance between supply and demand. Table 3 presents more detailed results from 'Trends and forecasts' revealing significant divergence between different natural sciences/technical education groups. For example, there is a projected excess of 'Programmers/system analysts' in the range between 22.100 (alternative A)[16] and 23.100 (alternative B)[17], which corresponds to 64 / 69 percent of the forecasted total demand for labour within this education group. The table also shows that the underlying assumptions sometimes have a significant impact on the projections. This is exemplified by the projections for the groups 'Natural science, etc (without a degree)' where the projection based on the assumptions in alternative A is a shortage of 7.200 persons, while alternative B projects an excess of 8.200 persons.

'Education and the demand for labour' projects a shortage of engineers with a Masters' degree, and a continued shortage of all types of engineering graduates, in spite of a slight increase in the number of degrees being awarded. The report also underlines the decline in the interest for vocationally oriented technical courses within upper secondary school. Only a few years ago there was a substantial reserve of labour in this category, but the 2002 publication of the 'Labour Market Tendency Survey' shows that employers have difficulties obtaining staff with adequate qualifications. Another problem identified in 'Education and the demand for labour' is the low expected outflow of qualified IT staff. This is visible in table 4, where it is shown that the outflow of system analysts/programmers is no more than 4.700 during the 1999-2008 period compared to a recruitment need for 13.600. This would add to the shortage, which according to the 'Labour Market Tendency Survey' has existed since the mid-1990s. The crisis that has hit many IT consultancy companies in the past year is due to exaggerated optimism regarding the demand for this type of service, and not to the market having stopped growing.

---

16 Assuming structural development at the same rate as during the 1990s

17 Assuming structural development at 50 percent of the rate during the 1990s

The AMS also warns that significant shortages within the IT sector could reappear within a couple of years. In particular since the negative trend has affected young peoples educational choices, which has resulted in that it is difficult to fill available education places. The exceptions from the future positive trend are expected to be web designers and web masters. AMS (2002c) forecasts an increasing shortage of labour within the technology industry sector during the period until 2015 due to that too few persons with adequate skills are being trained in order to meet future retirement exits. The Confederation of Swedish enterprise (2001b) shows that 95 percent of the companies within the IT/Telecom sector answered that their recruitment need persons with higher education within the next few years will be strong (58%) or moderate (37%) whilst only 5 percent answered that they would not have any need at all. This is relatively high compared to the traditional industry sector where one fourth of the companies answered that they would not have any need at all, and only 9 percent expected a strong demand for labour.

Health care[18]

The results from supply and demand analyses concerning personnel resources within the health care sector are unambiguous. In the long term forecasts by the AMS and SCB from 1998 and onwards identify the shortage of labour within health care as the main outstanding problem. The results presented in table 6 are unambiguous; half of top-ten occupations epriencing the most significant shortages are found within the health care sector. The caring sector is also the sector where the short term 'Labour Market Tendency Survey' from 2002 identifies the most significant problems, with shortages of experienced staff in almost all educational fields. Two examples from table 5 are physicians and general nurses where the percentage of employers experiencing shortages is 63 (physicians) and 82 (general nurses) percent. Furthermore, a significant share of the employers expects the short-term needs to increase for both groups. Furthermore, an investigation by the AMS reveals that 40 percent of the personnel within elderly care and disability care lack further education. AMS expects employment within health care services to grow at a reduced rate, due mainly to scarce municipality resources but also as a direct consequence of the recruitment problems.

In 'Trends and forecasts' it is warned for extensive long run shortages of personnel within health and medical care education as a result of a double effect caused by a situation with increasing demand and decreasing supply. The number of young people choosing the health care programme in upper secondary school continues to be very low compared with the situation 10 years ago. If interest in such education does not increase, the already large shortages of personnel with health care qualifications will become even greater. Demand will increase above all for care of the elderly, but also to a certain extent for health and medical care. The shortage

[18] Health care comprises of health, dental care and support service sectors

will occur mainly among individuals with health care education at the upper secondary school level, but the shortage can also be large for nurses, despite the increased education capacity. This trend is visible in table 3, which indicates significant shortages of labour regarding a range of different education groups within the health care sector in 2020. The most significant shortages refer to 'child and recreation', 'caring' and 'nurses'. The increased admissions to educational programmes for physicians and nurses will have a very limited impact on the availability of staff before 2008, at least where physicians are concerned, according to 'Education and demand for labour'. As regards staff educated for childcare, the calculations also indicate a growing shortage.

According to forecasts of the future personnel supply within the health care sector carried out by the AMS (AMS 2002b) the total need for personnel with higher education qualifications is 180.000 persons during the period 2000-2015. This should be considered in relation to total supply, which amounts to 100.000 persons during the same period. The most serious recruitment problems concern nurses, in particular within the municipality care. The interest for these studies is large but the educational dimensioning is insufficient, despite the increased capacity planned for the period until 2008. The total demand for personnel with caring qualifications is estimated to 347.000 persons between 2000 and 2015, or an annual average of 23.000 persons. During the same period the forecasted supply from upper secondary education is 1.000 persons per year whilst the annual supply from adult municipality education is expected to be 6.000. This implies that total supply corresponds to less than 30 percent of total demand during the forecast period. The report also identifies a more complex health care sector with ongoing structural changes. New activities growing in significance are related to areas such as medical information, consultancy and health information. These developments bring demand for new competences within fields linked to IT and technology such as medical informatics, health informatics, etc.

Teaching

The majority of the forecasts indicate an increased shortage of teachers but the long-term forecasts are somewhat ambiguous. 'Trends and Forecasts' published in 1999 forecasts a temporary shortage, which is expected to turn into a surplus after 2010. The expectation is that the need for teachers in upper secondary school until 2010 will increase dramatically and then decrease as dramatically over a few years. The 'Trends and Forecast' published three years later projects an overall increased shortage of teachers but great variations by teacher category as a result of the large variations in the size of cohorts. This suggests that a comprehensive redistribution of educational capacity among different categories of teachers will be inescapable in the long run. 'Education and demand for labour' warns that the existing shortage of staff in the teaching field may grow worse on an aggregate level. This would imply staff shortages despite the substantial potential for substitution between compulsory

school class teachers and subject teachers. The greatest scarcity will arise for teachers in vocational education, according to 'Education and demand for labour'. The shortage of teachers, given the current educational dimensions, will reach 30.000 within primary and upper secondary education in 2005, according to AMS forecasts in 1998. Between 2005 and 2010 there is an expected additional shortage of 20.000 teachers in upper secondary school. Table 4 shows that 'Education and demand for Labour' projects a shortage of 14.400 compulsory school teachers in 2008, while there is an expected excess of 3.900 subject teachers.

The short-term shortage of teachers is instantly recognizable in the AMS shortage index presented in table 6, where the figures for several teacher occupations are close to the ceiling. SCB's 'Labour market tendency survey', presented in Table 5, also indicates a significant shortage of primary school teachers (forms 1-7) within the fields of Swedish and social science, and secondary school teachers (forms 4-9) with specialisation towards maths and natural science oriented subjects. The demand for higher secondary school teachers is also expected to lead to further staff shortages during the coming years. In total, the 2002 survey identifies a shortage of both experienced and newly qualified staff in nine out of fourteen educational groups. The shortage is greatest for specialist teachers, recreation instructors with occupational experience, and newly qualified recreational instructors. Teacher groups where there is a balance between supply and demand include arts education teachers and upper secondary school teachers specialised in mathematics and natural sciences.

The prognosis for the future personnel supply in the education sector until 2015, published by AMS 2003, states that teachers are among the occupation groups with the highest average age on the labour market. This implies that the recruitment need only to replace retiring teachers during the period between 2003 and 2015 amounts to 100.000 teachers, which corresponds to 40 percent of all today active teachers. The total recruitment need for teachers within childcare and school activities points towards approximately 154.000 persons, or 12.000 per year. This figure does not account for the 35.000 active teachers lacking formal qualifications. Simultaneously, the new supply of teachers has been too low. Today's volume of education would provide closer to 100.000 teachers from the regular teacher education during the forecast period. Consequently, there would be a shortage of 54.000 teachers at the end of forecast period. Nevertheless, there are differences between different teacher fields.

Recruitment need for personnel within child care and pre-school is significant and expected to increase as a result of increased demand and additional budgetary allocation for personnel supply within the sector. There is also a significant shortage of teachers within primary education. The pupils in the lower age groups are decreasing but at the same time they are increasing at the senior level of primary education. Nevertheless, further municipal budgetary allocation towards personnel

supply will imply significant recruitment needs at all levels within primary education. The problem to recruit upper secondary teachers is projected to reach its top in 2010. The shortage is present for all fields but maths and natural science stand out as the main ones.

Construction

It is very difficult to make adequate personnel projections within the construction sector. There are few, if any, branches where the trend has been characterised by so significant and rapid changes as within this sector. The number of employees amounted to 320.000 in the early 1990s and it was down to 217.000 during 1997, before the sector started to recover. In 2001 232.000 persons were employed within the construction sector. The National Labour Market Board (2002) also underlines that it is difficult to forecast the future supply of labour within the construction sector, as there is a lack of judgements about the long-term supply of constriction educated. The investigation based on the regional and local interviews with 10.000 employers during autumn 2002 indicated a shortage of educated labour within all contraction occupations included in the questionnaire. 'Where are the jobs 2003?' states that the activity within the construction sector has calmed down, and that unemployment within the branch is increasing. Nevertheless, in line with several other prognoses, the report also warns for long-term shortages in the sector. The short-term forecasts also show that demand within the sector diverge significantly between regions. The recruitment problems are increasing in the areas around the main cities and other expanding regions.

'Trends and forecasts' also warns for increased recruitment problems in the long term, after the 30 percent decrease during the 1990s. Table 3 presents the results from 'Trends and forecasts' where scenario A would imply a shortage of 19.900 individuals with upper secondary education construction qualifications (14 percent of the total demand), and scenario B a shortage of 1.900 workers (1 percent of total demand). The base scenario in the AMS report on the personnel supply within the construction sector until 2015 (AMS 2002d), is that employment within the sector must grow by one percent per year during the whole forecast period in order to match meet future needs. This assumption is considered as moderate and minimum growth limit in the report. The number of retirements during the forecast period amounts to 87.000 employees, which implies that 38 percent of the employed within the entire branch should be replaced. AMS calculations suggest that even with negative employment growth there will be a shortage of 20.000 workers in 2015. If the employment growth within the sector is one percent the forecasted shortage reaches as many as 97.000 workers.

2.2 Consequences of Recruitment Problems

Labour market mismatches can be considered from many different aspects. Perhaps the most central mismatches related to qualification needs, are cases where the employers have difficulties to hire at sustainable market wages (shortages), and where the difficulties to hire have a negative impact on the firms' expansion potentials (bottlenecks). It is far beyond the scope of this paper to analyse whether projected mismatches in Sweden correspond to real shortages and bottlenecks. However, it is interesting to regard some examples of consequences as a result of recruitment problems. This may serve to shed some light on the characteristics of the mismatches existing on the Swedish labour market today.

According to surveys comprising of approximately 3.000 member firms within the Confederation of Swedish enterprise (Svenkst näringsliv 2001a, 2002), almost half of the companies experienced much longer recruitment procedures than normally. One fourth of the vacancies remained non-filled, 15 percent took temporary personnel into service, and one third lowered their qualification requirements. One fourth of the companies experiencing recruitment problems had to cut down on production/services, one fifth were not able to increase their production as much as planned, and in over 70 percent of the firms, the working load for the personnel increased. A study by NUTEK, based on interviews with 200 companies revealed that half of companies that had recruited personnel during the reference period, experienced recruitment difficulties. Over 40 percent of all vacancies were found difficult to fill. The companies were able to hire someone with the desired qualifications in 37 percent of these cases after an extended vacancy period. In over one third of the difficult-to-fill vacancies the companies lowered their requirements in order to fill the vacancy, and 28 percent of these vacancies remained non-filled. (Ds 2002, refering to NUTEK 2000, 'Kompetens – en bristvara? Företagens syn på kompetensförsörjning')

Tables 7-11 below are based on information from the AMS report 'Arbetsmarknadsutsikterna 2003' (Employment Outlooks 2003). Table 7 shows that approximately one fourth of the companies in the survey have high personnel utilisation i.e. they could not increase production and sales without recruiting more staff. More than one third of remaining firms would need to recruit personnel in order to increase their activities with more than 10 percent. Only 17 percent of the companies have significant available resources *i.e.* they have the capacity to increase activities more than 20 percent without new recruitment. The highest personnel capacity utilisation is found within the construction sector. Close to 40 percent of the companies in this sector would need to recruit personnel in order to increase their activities, and 6,4 percent have significant available resources.

Table 7: Available personnel capacity, percentage of firms (Autumn 2002)

Industry sector	**0 %**	**1-10 %**	**11 –20 %**	**21-30 %**	**> 30 %**
Construction	38,8	37,9	16,9	3,7	2,7
Industry	23,7	39,6	23,2	7,9	5,6
Finance/Consulting	19,7	32,1	24,6	13,2	10,4
Transport/restaurant, etc.	27,6	36,0	21,1	9,1	6,2
Retail	16,3	32,4	29,4	12,9	8,9
Total	23,9	35,6	23,6	9,9	7,0

Source: National Labour Market Board 2002a

The results presented in table 8 suggest that, in general private companies did not experience any significant recruitment problems. However, it appears somewhat more difficult to recruit labour with desired work experience than with adequate education. It is also revealed that the requirement concerning work experience is more frequently reduced than education requirements as a response to recruitment problems; over one fourth of all companies with recruitment difficulties lowered their experience requirements compared to 16 percent lowering the education requirements. The main exception to the relatively small recruitment problems is the construction sector, where over 30 percent of the firms in the survey experienced recruitment problems in terms of educated as well as experienced labour.

Table 8: Recruitment problems and solutions (Autumn 2002)

Industry sector	**Recruitment problems**		**Solution**				
	Educated labour	Experienced labour	Extended vacancy	Lower education require-ment	Lower experience require-ment	Did not employ*	Other**
Construction	30,7	35,2	18,5	10,6	19,5	47,4	17,3
Industry	13,9	17,8	32,9	21,5	30,0	42,0	21,5
Finance/Consulting	10,3	15,4	36,0	9,3	21,6	24,0	24,3
Transport/restaurant, etc.	13,4	15,7	36,6	16,5	31,5	21,9	36,3
Total	15,3	18,6	31,9	16,0	26,4	31,0	24,5

* Includes buying services from other companies and rented personnel
** Includes lowered social competence requirements, recruitment from abroad, etc.
Source: National Labour Market Board 2002a

The most common consequence of recruitment problems for private companies (table 9) was increased overtime for the personnel. This occurred in over 60 percent of the firms with recruitment problems. It is also relatively common that the firm is forced to turn down an order, decrease production, or contract out production to other firms. Almost 30 percent of the firms with recruitment problems answer that wage costs increased as a consequence of the recruitment problems.

Table 9: Consequences of recruitment problems (Autumn 2002)

Industry sector	No to orders	Increased overtime	Decreased production	Contracted out production	Postponed expansion	Planning internal training	Increased wage costs
Construction	50,9	50,4	21,1	31,9	13,3	7,6	28,7
Industry	18,1	69,8	27,8	29,7	13,4	15,8	31,0
Finance/Consulting	32,1	60,8	22,3	18,9	18,4	9,8	24,8
Transport/restaurant, etc.	18,2	69,3	33,7	12,8	9,6	11,5	35,6
Total	26,2	62,7	28,4	21,3	14,0	10,9	29,6

Source National Labour Market Board 2002a

Turning to the pubic sector, the AMS survey reveals that 92 percent of the municipalities experienced problems in recruiting staff with adequate education and 68 percent had difficulties finding experienced labour. The solutions to the recruitment problems can be seen in table 10. Most of the municipalities found an acceptable solution, although it took longer than desired. In most situations, the qualification requirements – mainly the education requirements – were lowered. Over half of the employed within elderly and disability care in 2000, lacked caring education. In one fifth of the cases, the municipalities rented personnel, and in some cases the services were bought from external providers.

Table 10: Solutions to recruitment problems in the public sector (Autumn 2002)

Industry sector	Rented personnel	Bought external services	Extended vacancy	Lower education requirements	Lower experience requirements
Child care	9,5	4,1	37,8	71,6	47,3
Elderly/disability care	44,3	11,5	59,0	42,6	32,8
Education	3,9	2,9	38,7	80,4	36,3
Health care	35,3	11,8	46,2	17,6	20,2
Total	19,7	8,9	46,7	51,2	34,7

Source: National Labour Market Board 2002a

Table 11 demonstrates the consequences of recruitment problems in the public sector. Twelve percent of the municipal employers failed to solve their recruitment problems, and more than half of them were forced to apply increased overtime. Almost as many had to reduce service quality, and in more than 20 percent of the cases with recruitment difficulties service quantity was decreased. Forty percent of the recruitment problems led to increased wage costs. Internal training was employed by 13 percent of the public enterprises in the elderly/disability sector, and only by 4 percent in the childcare sector.

Table 11: Consequences of recruitment problems in the public sector (Autumn 2002)

Industry sector	Internal training	Increased wage costs	Lower quality	Increased overtime	Postponed planned expansion	Lower quantity	Contracted out services
Child care	4,1	28,4	47,3	45,9	1,4	16,2	1,4
Elderly/disability care	13,1	62,3	36,1	72,2	9,8	18,0	8,2
Education	10,3	22,5	58,8	27,0	2,5	6,4	2,0
Health care	10,1	58,0	29,4	70,6	13,4	38,7	5,0
Total	9,8	39,9	45,5	55,9	6,5	22,8	5,6

Source: National Labour Market Board 2002a

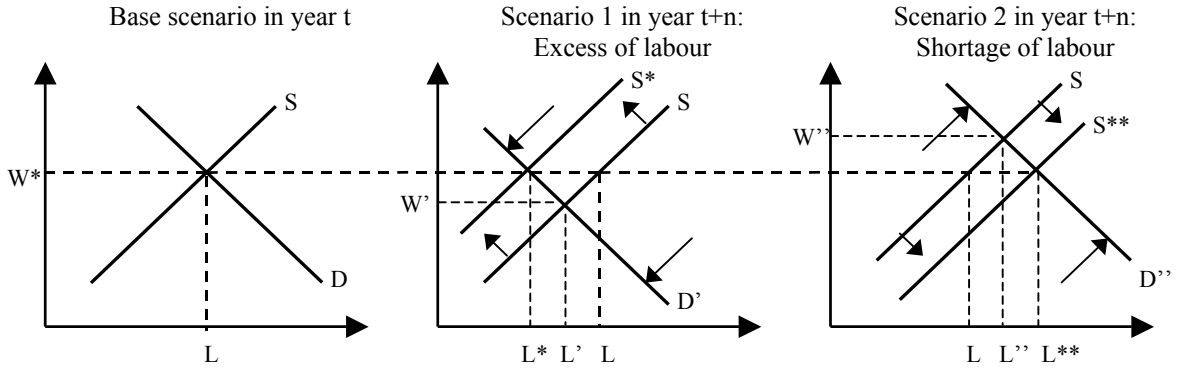
3 The Qualification Supply Adjustment Process

Economic theory tells us that, given certain market conditions, price adjustment will erase mismatches and bring the market back into equilibrium without external interference. Nevertheless, the purpose of this report is not to describe the labour market adjustment process, where wage adjustment and employment opportunities are central factors. The aim is to account for active public supply adjustment when the projections indicate that future supply is insufficient to allow for an optimal match of future needs at sustainable market wages. The three diagrams below represent the supply and demand for labour with a certain type of qualification (Qi) in year t, and two different scenarios in t+n. The figure demonstrates the situation that would occur in t+1 given the same education/training dimensions as in year t.[19] In scenario 1, the forecasted demand for Qi is D', which would result in an *ex ante* excess of labour equal to the distance between L*L. In scenario 2 the forecasted demand for Qi is D'', which would result in an *ex ante* shortage of labour represented by L**L. This does not necessarily imply that wages are inflexible and that there would be *ex post* skill gaps on the labour market. There may be other reasons than mere labour market equilibrium for the government to engage in supply adjustment. In Scenario 2, the public efforts to shift supply from S to S** would imply a long-run equilibrium where the number of workers with qualification Qi is L** at wage level W*, while market adjustment mechanisms would clear the market at wage level W'' with a supply of L'' workers. This could be an example of public efforts to increase the supply of labour with strategically important types of qualification e.g. for economic growth or to provide public services. In Scenario 1 the rationale may be to avoid a

[19] This assumes that without the presence of public supply adjustment (including the efforts to offer information about future demand), individuals would base their decisions about qualification on the basis of the labour market situation in year t.

decrease in wages for equality reasons and/or to enable an increase in the supply of workers with other qualifications.

Figure 4: Meeting qualification needs through supply adjustment



The central question to be analysed is concerned with Swedish strategies to tackle labour market supply shortages before they occur (*ex ante* supply gaps). A second important aspect of the active supply adjustment process is concerned with measures acting to correct disequilibria if they occur (*ex post* supply gaps). The supply adjustment efforts accounted for in this report are primarily concerned with education and training targeted towards occupation areas experiencing shortages. Other approaches to tackle labour market supply shortages e.g. revising laws related to the procedures of hiring and firing, efforts to improve the status of the branch, and stronger requirements for unemployed to take up jobs are not included in the discussion.

The first section below accounts for some general remarks about forecasts and their information value. Following sections describe the supply adjustment process by type of institution. The discussion concentrates on strategies acting to provide 'targeted' qualifications for a certain occupation, rather than 'generic' qualifications to enhance labour substitution possibilities. The discussion is not restricted to interventions with a direct link to forecasted labour market needs. It also provides a brief overview of the institutional framework, and examples of networks for ongoing contacts between education/training providers and the surrounding society.

3.1 Remarks About Labour Market Forecasts

"From the neo-classical perspective, the labour market is dynamic and very hard to predict. This implies that the principle of educating the appropriate numbers of students with the

> right mixture of skills, ready to enter labour market in ways that bring supply into balance with demand, will often fail. Thus, the core argument suggested by proponents of neo-classical economics theory is to recognise the inability of society to anticipate long-term labour market needs, and hence not to sequence highly focused educational activities towards those anticipated needs, as commonly are the main target with VET (Monk, 2000)." (Lindell, Johansson 2003. page 111)

> "Instead, neo-classical oriented economists, notably proponents of human capital theory, emphasise types of education which are more broadly instrumental in promoting versatility and resilience, hence enabling students to move from job to job. As a result of this kind of thinking, the human capital economists tend to see academic forms of education as the better hope of economic growth (Becker, 1964/1983)." (Lindell, Johansson 2003. page 111)

It is a difficult task to make adequate projections of future labour market qualification needs, in particular concerning long-term prognoses. It is also generally agreed that available statistics are unable to provide education planners with precise information. Consequently, projections should be interpreted as indications of what is necessary, to achieve efficient matching between demand and supply on the labour market, rather than the most probable development. The purpose of this paper is not to discuss neo-classical scepticism regarding the feasibility to forecast future qualification needs. However, it is interesting to consider some examples highlighting how the projections can be interpreted within the Swedish system of qualification supply. The central question is concerned with the information value for education planners, rather than for individuals and employers.

Some qualification needs are relatively straightforward to identify, for example occupations with clearly identifiable qualification demands. This is most notably in professions such as medicine, nursing, teaching, etc. but also within several other more general occupations. Nevertheless, for the majority of professions, it is likely that more that one type educational background could match the demand for labour with adequate qualifications. HSV (1999a, 2002c) states that the prognoses are generally too strongly focused on previous graduations and programmes. This does not reflect the general trend among university and university college students where participation in programmes leading to a professional degree account for a diminishing share of total students in higher education. Students tend to choose courses according to their own interests and perceptions of what composes a good combination. This normally leads to a general graduation, which could be similar to a traditional professional degree but it could also be an alternative to a professional degree, depending on the choice of courses. Likewise, the forecasts cannot account properly for new interdisciplinary education tailor made according to the demands of clients and co-operation partners. The issue is particularly important since the Government explicitly emphasises the importance of interdisciplinary education in order to provide the labour market with multidisciplinary qualifications. HSV (1999a, 2002c) also argues that too little weight is given to general graduations that can be utilised within different areas, which implies that the qualification supply is underestimated. AMS (2002c) underlines the difficulty to relate upper secondary

education non-vocational programmes as well as more general higher education programmes with inflows to a specific sector.

Another problem is that the forecast by Statistics Sweden cannot fully account for outflows from higher education in cases where the education was not completed. An analysis of the graduation rate referring to students starting university or university college education in 1993/94 revealed that 50 percent had graduated in 1999/00. One third of those who did not graduate had completed courses corresponding to a three-year full time study. It was also shown that graduation rate varied between educational groups. It was higher for education leading to a professional graduation (e.g. medicine, nursing, teaching, etc) and lower for general graduations (e.g. bachelors' and masters' education). HSV (1999b) argues that a formal graduation is not the sole intention of persons engaged in higher education. The expansion of distance education and the implementation of life long learning implies that many students have other aims than graduation. Others end their studies before graduation due to employment opportunities or to continue their former jobs. This development is to a large extent planned and supported and it would be wrong to base conclusions about qualification supply based merely on the number of graduations.

The forecasts also have a potential to change rapidly, and identified trends vary due to different forecast periods, the information available, different aims and methods, etc. For example, the long-term forecasts are normally based on register data and assumptions about labour market developments and flows. In contrast, the short-term forecasts are based on interviews with employers. Regarding the long-term forecasts it is obviously a difficult task to predict the next two decades based on the developments during the last two decades. Fundamental conditions vary, in particular regarding the demand for labour, which is based on different judgements of the economic trend employment outlooks, sector composition, future qualification requirements, etc. Thus, it is difficult to find something that can be considered a 'normal' situation for the labour market during the last 20 years. This in turn, means that simple trend analyses do not provide much direction for the future. Two factors highlighted by SCB (2002b) could serve to exemplify the type of difficulties encountered: i) Will the structural changes during the 1990s have permanent or temporary consequences for unemployment and people's participation in the world of work? ii) Which are the long run implications for labour market participation of the new pension system – where the pension is based on lifetime income – and the growing number of people spending more time in education? The calculations of educational supply assume essentially stable educational dimensions and the impact of labour market disequilibria on individual decisions, educational dimensions are disregarded in the analysis, and employers' demand is assumed unaltered by the supply of competences. Likewise, the forecasts can obviously not take the innovation of new jobs and new types of education into consideration. An evaluation of SCB's earlier forecasts showed that that the precision

of judgments regarding the demand for labour by branch has been relatively low, whilst the prognoses of needs in terms of professions have been more reliable.

3.2 Upper Secondary Education

Upper secondary education offers 17 national programmes with different specialisations,[20] where all programs have a three-year duration that provides a broad general education and qualifications matching the admission requirements to higher education. A person has the right to begin upper secondary education in a regular upper secondary school until the year he/she is 20 years old. Almost all compulsory school students continue on directly to upper secondary school and the majority of these complete their upper secondary education in 3 years. Upper secondary education is mainly provided by the municipalities, and to a smaller extent by independent schools and County Councils (health care and natural resource programs).

Government management and responsible institutions

The task of upper secondary education is to further develop the basic knowledge from compulsory education in order to prepare the students before the working world and higher education as well as to prepare the individuals before adult life as a responsible member of society. The Swedish Parliament and Government lay down the curriculum, national objectives and guidelines for upper secondary school as for the whole public school system. The federal budget provides municipalities with a sum of money to carry out the various municipal activities. Within the objectives and framework established by Government and Parliament, the individual municipality may determine how its schools are to be run. A local school plan describing the funding, organization, development and evaluation of school activities shall be adopted. Using the approved curriculum, national objectives and the local school plan, the principal of each school draws up a local work plan. This is done in consultation with the school's teachers and other personnel.

The National Agency for Education (NAE) is responsible for the public school system and thus for upper secondary education. The agency was formed in 1991, coinciding with a change in responsibility for the school system. State control was replaced by a target-oriented system with significant local responsibilities and the municipalities were given responsibility for school organisation, staffing and resources. The agency's primary responsibilities include national monitoring, evaluation and supervision of all school activities, and central development work within the school sector. Since March 2003 the Agency is divided in two authorities;

[20] See Annex 1

The National Agency for Education and the National Agency for school development. The purpose of this change is for the objective assessment of the schools in order to improve education quality. The National Agency for Education will focus on quality control through follow-up, assessment, inspection and quality supervision, whilst the National Agency for School Development will support education coordinators and local units' work with the development of the activities within public education.

Networks for ongoing contacts with the surrounding society

The NAE underlines the importance of the link between the needs of the working world and expectations of the school in order to promote local, regional and national growth. Experiences from recent development work show that co-operation between school and business life is crucial in some smaller municipalities and in regions with one-sided business structure. The reform of upper secondary education during the 1990s implied that the prior regulations about joint collaboration bodies with working life were abandoned. The purpose of the deregulation was to promote a more liberal and flexible form of co-operation between school and business life that could be adjusted according to local needs. Nevertheless, there is a risk of conflict between the needs of the labour market and the demands of the individuals and, likewise, between short-term supply according to current business structure versus broad supply promoting long-term flexibility and structural development. In order to ensure the optimal solution, the NAE (2002b) advocate a broad collaboration between school and the working world. Cooperation between schools and the world of work proceeds partly through the medium of joint committees for the programmes of local upper secondary schools and some municipalities also have joint planning committees. A third important instrument is the training of supervisors for the persons who support the students in work place training and within project work.

Support for networks within natural science and technology

The technology program was introduced autumn 2000 at upper secondary education level and simultaneously, new fields and subject areas appeared within the natural science programme. The National Agency for Education is now offering teachers within these programmes to apply for subsidies to support network building promoting co-operation and communication. The networks could comprise collaboration between schools, different levels of education, or between schools and business life.

School – Working life website

The School – Working life website (www.skolverket.se/skolarb) provided by the National Agency for School Development, offers an Internet based meeting point for

interested parties within the areas school – working life – surrounding society. The site is aimed for pupils, teachers, study and occupational guidance assistants, school authorities and representatives from the world of work. Its purpose is to distribute examples of work practices and organisation forms as well as to support dialogue and networks in different areas.

ArbetslivSkola – For dialogue between school and the world of work

ArbetslivSkola (www.arbetslivskola.info) is a an online information and meeting point to promote dialogue for everyone working with or wanting to develop technical education on upper or post-upper secondary education. In addition it provides information to potential students. Nine vocational committees (yrkesnämnder) within the areas of industry and vehicle technology are behind the initiative and the purpose is to work for an improved collaboration between business life and school as well as to distribute information to teachers, school leaders and the study and careers counsellors about the technical branches and different activities concerning technical education. The website presents information from the employers perspective and the purpose is to compliment other sites provided by interested parties within the education system.

Development of vocational programmes through collaboration between school and the working world

In 2002 the NAE completed a Government assignment to support quality improvements in the vocational programmes (Skolverket 2002b, 2002c). The agency provides an overview of the main activities under five different types of activities. The first issue accounts for the collection and distribution of 40 best practices with focus on the links between programme specific subjects and vocational subjects, the relationship between education and the surrounding society, teaching linked to reality, and motivating language studies through international perspectives. The best practices exemplify how collaboration between municipalities, upper secondary schools, local firms and branches has served to improve teaching in the programme specific vocational programmes. There are also best practices where co-operation is applied to develop an occupational field, and to improve the quality of the work-place training. Other themes that have been emphasised relate to the schools' efforts to adjust vocational programmes to the needs of pupils and the local labour markets. Best practices are published on the website of the National Agency for Education. The second type of activity refers to nine research based development projects being carried out within the project, including the creation of a network for the researchers engaged in these projects. The outcomes include the involvement of researchers and higher education institutions, which strengthen the link between research and the vocational programmes. It is also the first occasion in a long time that researchers within the field had the opportunity to meet in a research network.

A third part of the project directs support towards competence development and regional/local collaboration with business life. The central reference group with representatives from the working world is linked to four regional reference groups, in order to strengthen the relationship between vocational programmes and the local/regional working world. A dialogue between the NAE and key regional actors has also been initiated in some other regions. There are also good practices of networks between schools such as the co-operation between four university colleges providing teaching education in different parts of the country and six networks related to the health care programme comprising 150 persons, mainly school personnel but also representatives from the surrounding society. In total, the efforts have been comprehensive comprising 335 schools that have been represented at NAE conferences. One of the general outcomes from the contacts with the surrounding society, is that issues such as basic vocational training and the relationship school-working world have been highlighted on the agenda (Skolverket 2003). The fourth group of activities refers to the national reference group with representatives from the social partners and interested parties, which has been engaged in the project. The contacts established through this group made it possible to reach organisations from the regional and local working world in order to provide information about the project. In the fifth group of activities, the NAE highlights the efforts to distribute information, ensure exchange of experiences, and to intensify the discussion about the potentials of upper secondary vocational education. The strategy for these activities focuses on targeted information and dialogue towards different levels within the system (municipal, regional, central, and research level). The discussion is linked through the website being constructed within the project Skola-Arbetsliv. Nine larger conferences and some 50 ‘open-house’ events have also been arranged throughout the country during the period from 2000 until 2002.

Attraktiv Skola

Attraktiv Skola (Attractive school, www.skola.se) is an ongoing development project aimed at increasing the quality of Swedish schools and the appeal of the teaching profession. The project consists of a national umbrella project and various individual projects in the participating local authorities. The aims and objectives of the national project determine those of the local projects. However, their focus, organisation and implementation are determined by local needs and opportunities. In 2000 all the local authorities in Sweden were invited to take part in this 5-year educational development programme organised by the Swedish Union of Teachers, The National Swedish Federation of Teachers, the Swedish Association of Head Teachers and Principals, the Swedish Association of Local Authorities, the Swedish Ministry of Education and Science and the National Agency for Education in a unique joint venture. More than 100 local authorities applied to take part in the project, of which 34 were selected. The tasks include efforts to create work organisations that support development and quality improvement initiatives in schools, explore new development and career opportunities for teachers, promote development in schools

via partnership with universities and the business community, etc. It is highlighted that achieving the goals requires the co-operation of society in general, especially the universities and business community.

Supply adjustment – institutional framework, strategy and measures

During the 1970s and 1980s, a number of measures were taken to improve upper secondary schooling so as to match the needs of the labour market and those of higher education with the wishes and requirements of young people. A reform of the structure of the upper secondary school was initiated in the end of the 1980s and a new system of upper secondary was fully implemented by the school year 1994–1995. The most important objective of the reform was to raise the general educational level and prepare every-one for life-long learning. A second objective was to increase the scope of individual choice for each pupil. The background was the rapid development in the world of work, where new occupations are developed with more complex content and where future changes are unpredictable. By making the upper secondary school more flexible young people should be equipped to meet these challenges. Municipalities were given the opportunity to provide local study branches (*grenar*) linked to the national programmes in order to meet student demand or as a response to local or regional education needs that are not offered within the nationally defined programmes. As from 2000/2001 the municipalities can provide locally designed study paths (*inriktningar*). In order to prepare all young people for the demands of a changing the working world as well as for further studies, the reform also extended all the upper secondary programmes to three years and introduced the same core subjects[21] in all national programmes. Thirteen of the 17 programs contain at least 15 weeks at a workplace outside the school, so-called 'workplace training'. Alongside the national programs, there are also a number of specially designed- and individual study programs. Among the students attending the first year of upper secondary education during autumn 2001, 77 percent attended a national programme, 8 percent a specially designed program, and 15 percent participated in an individual programme. (www.skolverket.se)

The curriculum for upper secondary education underlines the importance for individuals to have the opportunity to find their own way to participate in society. The number of places on different programmes and focus within them should be adjusted in line with the desires of the students. In principle, students also have a right to receive their first choice of program. Hence, upper secondary education dimensioning is based on the demands of the students. The NAE determines which courses are compulsory for a national specialisation. According to the law (1985:1100), the municipalities are required to offer a broad selection of national programmes.

[21] English, the Arts, Physical Education and Health, Mathematics, General Science, Social Studies, Swedish (or Swedish as a Second Language) and Religion

Work place learning

Work place learning (Lärande i arbetslivet) is a pilot activity offering a new, modern apprenticeship programme. The intention was to provide the programme until 1999 but it continues in order to gain more and broader experience about how work place learning can be developed. The aim of the programme is to provide conditions for a more flexible education and to facilitate the collaboration between the schools and the work places. Nevertheless, as for all other upper secondary education programmes the students should receive the qualifications required to enter higher education studies. The programme implies that a pupil on a national or specialised vocational programme spends at least 30 weeks of the education at the work place. School and business life should co-operate in planning and set the local objectives for the education. For each pupil starting the work place learning programme a state contribution of 15.000 SEK will be paid. This contribution is primarily aimed as compensation to the work places engaged in the project. The programme engages no more than approximately 2 percent of the students in a particular cohort.

The technology programme

The new technology programme could be seen as a response to the labour market needs and it has been formed in co-operation with pupils, business life, higher education institutions, and teachers. The programme is a broad upper secondary programme combining theoretical studies with practical problem solving activities. It is not a vocational programme, but technology should be taught in meaningful contexts related to practical problems rather than in a natural science perspective. The individual has significant freedom to choose between fields and courses. The purposes of the programme are to stimulate the pupils' interests for technology, to attract new groups of pupils, to develop basic knowledge within the technology filed, to prepare for higher education and the working world, and to develop the understanding of the conditions for business life. The programme allows for extensive freedom in terms of development of field specific courses, which has led to implementation according to different local strategies. Schools, municipalities, local companies and branch organisations have co-operated in order to develop and strengthen the programme specific subjects. There are several examples of links between education and practice within the programme, in particular through project work.

Development of education within natural science and technology

There are several public initiatives to enhance the interest for natural science and technology among the young. The purpose is to facilitate for teachers and schools to develop their programmes within these two fields. In the long run the purpose is also to increase the general knowledge within the NoT (natural science and technology)

field and to get more pupils to choose these fields at higher education levels. NAE HSV are administrating a Government assignment called the NoT-project. The technical foundation year[22] and the establishment of technology and natural science centres as well as resource centres within chemistry, physics, technology, and mathematics are among the good practices within this project. There is a network of 67 municipalities engaged in the NoT-project. Between 1999 and 2001 the Government allocated a total 70 million SEK to increase the competence of teachers, pre-school teachers and recreation leaders within the fields of natural science, technology, and environment.

Information and vocational guidance

Today's choices of education and vocational training are more complex than ever and the alternatives are numerous. At the same time the choices for young become more and more difficult, as they are also more important and the individual needs to develop a good knowledge about the surrounding society. Overall responsibility for educational guidance during upper secondary education has been given to the school heads of the upper secondary school. They have to ensure that the pupils obtain guidance on the educational choices in school as well as guidance concerning further studies and vocational training. Vocational guidance is concerned with the labour market as a whole and with individual sectors. It is organised in most of the programmes, and contacts with the surrounding society is an integral part of teaching. The NAE works with 'soft infrastructure' within the field of education in order to disseminate information about different types of education. The agency has initiated a project to develop an information structure for all types of education in collaboration with the AMS and HSV. The aim is to provide a comprehensive picture of the supply of education. The Agency also provides information on the Internet. One example is Utväg, (www.utvag.skolverket.se/start.htm) which provides on-line information about education paths in Sweden with the purpose to link the information about contents and steering of education. The main target populations are pupils, parents, and school personnel. There is also extensive on-line information available about subjects, course contents, and schools that can be accesses through the agencies Internet homepage. Universities, university colleges, local PES offices, business life and the social partners are other institutions mentioned in relation to educational/vocational guidance in the curriculum for the public non-compulsory school system.

[22] The purpose of the technical foundation year is to compliment upper secondary education programmes within the filed of social science or similar with the qualifications in order to qualify for higher education programmes requiring graduation from the technology or natural science programme.

3.3 Higher Education

The activities within higher education in Sweden traditionally comprises two central tasks: education and research. Although both are important instruments in the efforts to match qualification needs, this report concentrates only on the education assignment. The 13 universities and the 23 university colleges, which are generally state run, are the main providers of higher education in Sweden. They exist in more than 20 different places around the country, offering a wide variety of single subject courses and a number of longer study programmes. There are two kinds of degrees in the system of undergraduate education: General and professional degrees. The general degrees are: *Diploma* requiring 80 credits, *Bachelor's degree* requiring 120 credits, and *Master's degree* requiring 160 credits.[23] There are about 50 different programmes leading to professional degrees awarded upon completion of programmes of varying length (2 to 5½ years)

Higher education is financed directly from the state. Appropriations for universities and university colleges are based on proposals from the Government and they are disbursed as lump sums from Parliament to each institution. The basic principles of the allocation system are that appropriations are made as remuneration for results achieved. Results refer to the number of credits earned by students and the number of full-time equivalent students taught at the institution.

Government management and responsible institutions

The general aim for higher education in Sweden is that it should correspond to the needs of the labour market as well as the demands of the students. The objective is that 50 percent of all Swedes should enter higher education before 25 years of age. The National Agency for Higher Education (HSV) is the central agency responsible for matters relating to institutions of higher education. Its tasks include quality assessments, supervision, reviews, development of higher education, research and analysis, evaluations of foreign education and provision of study information. HSV should stimulate interest for basic higher education and research, and the agency is responsible for information about the activities and gathered supply of education offered by universities and university colleges. The responsibilities of universities and university colleges include the obligation to function in collaboration with the surrounding society and to use the experiences from this relationship actively. They should also increase the efforts to work in close co-operation with business life in order to form education programmes that are attractive for the students, and corresponding to the national and regional labour markets' needs. Other responsibilities include the task to develop their role in life-long learning as well as its methods for judgements of real competence. The National Admission Office to Higher Education (VHS), which is primarily funded by the universities and the

[23] 40 credits corresponds to 1 year of full time studies

university colleges themselves, is responsible for the co-ordination of the admission of students to universities and university colleges.

A new Higher Education Act and a new Higher Education Ordinance came into force in 1993. This legislation reduced the detailed influence of central Government, and a decentralisation of decision-making was implemented. The orientation of the programmes in undergraduate education was transferred to the institutions of higher education themselves, in the form of three-year assignments. Every institution of higher education functions as an admissions agency and makes decisions on the admission of students on the basis of certain general guidelines. An important objective of the 1993 reform of higher education was to give students a greater opportunity of choosing single subject courses for themselves and combining them into a degree. A Degree Ordinance stipulates the degrees that may be taken. The most recent major change of the planning and resource allocation procedures was carried out in 1997, in which the importance of the adjustment to the needs of the labour market was highlighted. Each educational institution receives a total amount of resources, which they can allocate between the different fields after their own judgement. That is, the universities and university colleges decide the types of education actually provided, whilst the Government defines the frame and certain guidelines for each university and university college in the steering document.

Networks for ongoing contacts with the surrounding society

The board of the National Agency for Higher Education has representatives from universities, university colleges and labour unions. The board analyses available prognoses of demand and supply of people with higher education qualifications, in its role as a qualified discussion forum, in order to highlight issues related to the interaction between education and labour market. The governing boards of universities and university colleges consist of a majority of external members i.e. representatives from trade and industry, municipalities and county councils. In this way, experience from different parts of society may influence the management of higher education institutions. As of 1998 the chairman of the governing board should be a person who has his/her main responsibilities outside the university or university college.

Forum on dimensioning of teacher education

In its appropriations proposal for universities and colleges, the Government indicates that when decisions on the dimensions of teacher training are being taken, consultation should be made with HSV and NAE. In recent years, to render this consultation more effective, the two agencies have organized joint conferences for all the universities and colleges concerned. In order to create a forum for consultation,

planning coordinators from HSV meet with clients at conferences, where the authorities contribute with relevant planning material as a basis for the discussions.

Collaboration with the surrounding society

Universities and university colleges have far-reaching possibilities for discussion and agreement with local and regional actors. In order to create a good co-operation climate the Government underlines a shared responsibility between the higher education institutions and the local and regional actors. Contacts and collaboration with business and industry, public sector activities, culture and adult education are becoming a major priority for institutions of higher education. This was made explicit in the Higher Education Ordinance in 1996, and is now generally known as the *Third Priority.* Dialogue between higher education and the 'clients' on the labour market accounts for an important role in the assignment to interact with the surrounding society. Next to this tangible dialogue there are also other forms of interactions. HSV published three reports during 1999-2000, which highlights the work related to interactions with the surrounding society. The reports demonstrate a wide range of variations, intentions, and organisational forms of collaboration on several different levels. HSV (2002c) presents several examples of how 'clients' and higher education institutions integrate in long-term planning processes in a way that has modernised education supply. One example is the national consortia within the framework of 5-year programs, which aim to provide tailor made flexible education adapted to the needs and requirements defined by companies. Universities, university colleges and industry research centres cooperate within the consortia in order to develop and implement the education. There are also several examples on individual university level such as the IT university in Gothenburg, which is a result of the collaboration between Chalmers, Gothenburg university, the municipality, and business life in Gothenburg. Another example is the university college in Kalmar that formed a bio medical instead of the planned bio chemical department after analyses of qualification demands. A third example is the hearings arranged by Karolinska Institutet, where representatives from the working world, students, and teachers discuss contents and focus of the education. Further examples of education resulting from interactions between higher education providers and the surrounding society are 'Business law with European focus' at Linköping university, 'IT-economist' at Halmstad university college, and 'Commercial IT-law' provided at Lund university.

Supply adjustment – institutional framework, strategy and measures

In the Government Bill (Proposition 2001/2002b) the Government states that higher education should be planned both according to labour market needs and student demand. In practice, the composition of programs and courses within higher education, as well as their capacity in terms of quantities, is the result of a rather complex process based on the Government' objectives, judgements of student

demands by the individual higher education institutions, and on the students' choices among the available programmes and single subject courses. Objectives with respect to the minimum number of full time equivalent (FTE) students as a whole and for the lowest number of FTE students in the science and technology areas are set out for each fiscal year. The purpose is to steer education supply towards the fields of technology and natural science. The education assignment may also stipulate that the number of FTE students must increase or diminish in certain subject areas compared to the preceding three-year period. There is a maximum funding, which defines the highest aggregate compensation for FTE students and annual performance equivalents permitted for the fiscal year. There are also a few graduation targets for certain fields, which are selected for labour market (professional degrees) or education policy reasons (masters' degrees). In 2000 there were five graduation targets referring to the number of i) master's degrees, ii) engineers and architects, iii) pharmacist, iv) upper secondary school teachers, and v) compulsory school teachers for grades 4-9. The objectives are stated in the steering document concerning the individual university or university college. The box below includes objectives sated in the steering letter concerning Lund University 2003.

The objectives set by the Ministry of Education and Science are normally based on forecasts by the Ministry's analysis department, which makes forecasts in co-operation with HSV and SCB. One exception to this rule is the objective for nursing, which is based on a special Government commission investigating the health care[24] sector in 1999. The allocation of objectives between university and university college is based on national rather than regional qualification needs. The decisive factors include student demand, education capacity, regional policies, the demand situation at different universities and university colleges, promoting new university colleges, etc. Development of contents and focus of courses and programs take place at the individual institutions, by responsible teachers, program councils, and within the education councils at the individual university and university college. This is where central parts of modernisation are initiated. As from the academic year 1993-94 students are able to choose their study route freely and to combine different subject courses into a general degree.

HSV does not generally undertake forecasts of their own but the agency organises and compares the forecasts undertaken by SCB and AMS. These forecasts account for an important part of the basis for decisions related on higher education dimensions. Nevertheless, regarding the actual use of quantitative forecasts, HSV (1999b) underlines the restrictions related to swift changes of education dimensions. For example, the time span between the planning of a new education and graduated students is between four and eight years. One important aspect is the recruitment of competent teaching personnel, specialised within the fields demanded by the labour market. Another important aspect is the quality of the

[24] Health care comprises of health, dental care and support service sectors

education, which sets a limit for the number of students that can take part in a particular education.

Box 1: Performance objectives for Lund University

The aggregated number of degrees within the field of engineering, as well as Diplomas, Bachelor's degrees and Master's degrees within the field of technology, should increase between 2002 and 2003. For the period 2005-2008, the number of graduations from the Psychology programme should increase. Furthermore, the following graduation targets should be ruling until further notice (minimum number of graduations).

Degree	*Objective 2001-2004*	*Planning condition 2005-2008*
Master of Science	3 740	[1]
Master of Engineering and Architecture	2 510	2 865
Nursing	570	680
Teaching (later years)	90	90

[1] At least the same level as during 2001-2004

The number of full time students (FTE) on aggregated level, as well as within the fields of natural science and technology, should increase 2003 relative 2002. Within education fields related to art the university can deduct a maximum number of full time students within the following educational fields:

- Maximum 56 full-time students within design
- Maximum 74 full-time students within art
- Maximum 379 full-time students within music
- Maximum 55 full-time students within theatre

Source: Ministry of Education and Science 2002

The needs of the labour market can be seen from many different perspectives. According to HSV (1999a) education planning related to the needs of the labour market identifies four different aims: i) growth and employment, ii) balance between supply and demand, iii) resource allocation between society sectors, and iv) fairness between groups and regions. There are also different ways of responding to labour market needs, and HSV argues that universities and university colleges have responded rapidly to the signals indicating increased future demand for interdisciplinary education providing IT competence. HSV views adjustment of education supply according to the needs of the labour market as a form of co-operation between higher education and the surrounding society. The purpose is not that education should be tailor made for certain future occupations, but to provide a solid base for a long working life. Likewise, the immediate demand for labour with certain qualifications is not the decisive factor for higher education dimensioning in Sweden. The central task is not to calculate future demands but rather to create a

good supply of educated persons in order to facilitate companies' recruitment of qualified labour.

Higher vocational programme for technicians

Higher vocational programme for technicians is an education within higher education for persons with at least four years of relevant working experience, and at least two years in vocational education at the upper secondary school level or three years in a general national programme. The admission requirement related to education can normally be replaced by two additional years of relevant working experience. The purpose is to provide wider and deeper knowledge within a defined occupation in order to carry out more qualified tasks. The duration of the programme, which is also suitable for those who want to work as teachers in vocational programmes, is normally three semesters. The individual university/university college takes the decisions regarding the contents of the occupational activities. In some situations they collaborate with representatives from related branch organisations within The Swedish Trade Union Confederation (LO), the Swedish Confederation of Professional Employees (TCO), and Swedish Employers' Confederation (SAF)[25].

Higher Vocational Education degree

As from 1st March 2003 there is a new degree within higher education called 'Yrkeshögskoleexamen' (Higher Vocational Education degree) that should replace 'Higher Vocational Programme for Technicians'. The latter will be provided in parallel with this new form of education during a transition period. 'Yrkeshögskoleexamen' is an education for those with some years of occupational experience but also for students leaving a three-year national programme at upper secondary school level. The duration of the programme is two years and it leads to a university diploma within a defined occupational field.

Graduation objective for teacher education

For the period 2002-2006 the Government has raised the graduation objectives for teachers with focus towards the upper level of compulsory education and upper secondary education. According to the new objective the number of graduates should increase from 2.600 in 2001 to 4 000 in 2002, and then they should be 3.700 per year. In addition, at least one third of all teacher degrees should have a focus towards mathematics, technology, or natural science.

[25] SAF was the predecessor to the Confederation of Swedish Enterprise

Commissioned education, further education, and distance learning

Externally focused education is one of the issues related to education dimensioning. The primary type of education in relation to the interaction with the surrounding society is commissioned education, other examples being further training and distance education. The demand for further education appears to have increased during recent years as an outcome of the enhanced emphasise on life long learning. In order to increase access for the employed to higher education resources there has been enhanced efforts on further education from several institutions of higher education. Various universities and university colleges are also engaged in Advanced Vocational Education although it is not considered as higher education. The enhanced emphasise on life long learning has also highlighted the importance of distance education. The development within Information & Communication Technology (ICT) and IT has brought new possibilities for the provision of this type of education, which is now provided by several universities and university colleges.

3.4 Advanced Vocational Education

Advanced vocational training (AVE) is a new form of adult education on post-upper secondary school level where one third of the time is spent in the advanced application of theoretical knowledge at a workplace. What this entails is not the traditional traineeship period, but active workplace learning and problem-solving in an overall educational context. AVE started as a pilot project between 1996 and 2001 as a result of an initiative from business life. Successful results from the pilot scheme led the Swedish Parliament to decide that AVE is included in the regular educational system in Sweden from 2002. AVE comprises 12 000 students allocated over 245 different programmes within 12 branches. In addition to vocational knowledge, the subjects intended for emphasis are, mathematics and natural sciences, computer technology and its uses, economics and economic thought, society and culture, language and communication. The education is post-secondary, in the sense that completed upper secondary education or equivalent knowledge is required for eligibility. However, the courses can generally not be counted as higher education studies within university and university college programmes. The main target groups are persons that recently completed upper secondary education and employees who wish to develop their skills within a defined area. Admission to AVE is based on different selection criteria, which in addition to the standard criteria also include interviews and knowledge tests, work experience, branch specific knowledge, and recommendations from employers. The providers of AVE can be universities and university colleges, municipalities, county councils, as well as natural or juridical persons. The employment market finances the expenses of the workplace training component of the education.

Government management and responsible institutions

The principle aim of AVE is to compliment vocational education within the higher education system in meeting today's employment market's direct need for vocationally qualified labour. Other important considerations are that the education should help to break traditional gender-bound patterns and that it should stimulate women's interest in occupations oriented towards the natural sciences and technology. The National Agency for Advanced Vocational Education (NAAVE) administrates AVE. A central task for the Agency is to co-ordinate the local needs of the education, closely linked to business life, with a more general national perspective. Another important task is to increase the attractiveness of the education among students and in working-life. NAAVE should also contribute to the target achievement of the regional development policy. This implies that the agency should be a co-operation partner in the regional growth programmes through analysis, method and competence support within its area of responsibility.

Networks for ongoing contacts with the surrounding society

The board of the NAAVE has representatives from the Government, the social partners, higher education, municipalities, and business life. Since the workplace-training element of AVE is so important, active participation by employers in designing the courses is a requirement. There should be a management group assigned with the task to control the education plan and that the defined objectives are achieved for each programme. Representatives from the working world are required to be in the majority in the management group for a course, which also should have at least one representative from the public school system, at least one from higher education, and at least one student representative. The NAAVE should also provide a report to the Government analysing the function of the three-party co-operation between higher education, municipality and business life in order to ensure education quality.

Supply adjustment – institutional framework, strategy and measures

There is a lack of Swedish post-secondary education with significant elements of workplace learning in many areas. AVE was started as a response to the increased need for post upper secondary education qualifications, in particular concerning education with less than two years' duration. The education should build up a bank of experience relating to new courses, new educational forms and new course providers. AVE provides education according to the needs of the labour market, and to some extent as a direct result of request from employers. The aim is that the courses should combine a practical orientation with in-depth theoretical knowledge. The subject matter is taken from the employment market, courses in higher education, upper secondary, supplementary and advanced courses. Workplace

learning is emphasised and around one third of the one- to three-year programmes is spent at the work-place. However, it must not be so narrow as to be in essence a form of in-house company training but active learning entailing problem solving an a pedagogic environment. In order to secure that programmes correspond to the actual needs of industry and commerce, the content and curriculum of AVE programmes are not considered at state level but are designed and implemented at regional or community level between enterprises and various course providers (higher education, upper secondary schools, municipal adult education and companies). The final decision to start a new programme is taken by the NAAVE. For identification of such shortage areas the NAAVE applies labour market statistics, as well as forecast from AMV, NUTEK, SCB, and other interested parties. In addition the agency is engaged in contacts with branch organisations, regional competence committees, and other interest groups on the labour market. Nevertheless, there are no restrictions in terms of sector on the enterprises in which AVE is to be provided. In fact, there are many areas in which AVE is conceivable, e.g. engineering industry, trade and tourism, agriculture or forestry and the forest industry, information technology, health care, the environmental sector. An application from a potential education provider only competes with other applications within the same branch. This means that it could be easier to become a training provider within areas that are highly prioritised for labour market reasons. It is required to include in the application a judgement of the labour market outlooks within the industry sector as well as the demand for labour with the specific qualifications provided within the education. A programme may run for a maximum of five times before its effect on the local and regional labour market is required to be re-evaluated by the NAAVE.

3.5 Labour Market Policy

The prime task of the Employment Service is to help the labour market to run smoothly as a result of jobseekers finding employment and job vacancies being filled promptly. To achieve this kind of efficient matching, the Employment Service has access to an array of initiatives designed to facilitate and support its operations. The purpose here is not to cover them all but to account for some of the main interventions to meet employers' demand with sufficient applicants in order to avoid staff shortages and bottlenecks. In contrast to the institutions within the general education system, the task of labour market policy is primarily to tackle existing, rather than future, supply shortages.

Government management and responsible institutions

The Government's overriding labour market policy objective is an efficient labour market with full employment and good economic growth. A partial objective is for 80 per cent of the population between the ages of 20 and 64 to have regular

employment in 2004. The general Government aim is a well functioning labour market with full employment and good economic growth. The Swedish Labour Market Administration (AMV) has the task of translating Swedish labour market policy into practice. This responsibility comprises policies that effectively contribute towards the target achievement through efforts to match jobseekers and vacancies quickly, augmenting the skills of the unemployed, supporting those who have most difficulty in obtaining work, and providing income security during a transitional period of involuntary unemployment

The central authority of AMV is the National Labour Market Board (AMS). The AMS has three duties, which are crucial for the planning and follow-up of the performance: 1) Set aims and guidelines for each County Labour Board, 2) distribute financial and other resources available for the AMV, and 3) follow-up and evaluate the results of the labour market policy performance. In each of Sweden's 21 counties there is a County Labour Board, to which the 325 local offices of the Public Employment Service (PES) are responsible. The Government aims are translated into operational aims by the AMV. The central, regional, and local level within the AMV collaborates in this breakdown process. The local PES offices, ultimately implement the aims set by the parliament and the Government. The most central objective in terms of matching qualification needs is the target that 80 percent of the employers should have sufficient applications. The objective is followed-up every month by a telephone survey among 6.500 randomly selected employers.

Networks for ongoing contacts with the surrounding society

The Employment Service's interaction with other parties in society concentrates on those aims, which are of importance for the achievement of the Administration's operational targets and of the overriding aims of labour market policy. The AMS management group has representatives from labour unions, the parliament, business life, municipalities, and the parliament auditors. Staff at all levels within the AMV co-operate with others in many different ways, important among them being the 230 Local Employment Services Committees, where national labour market policy is reinforced with reference to local needs and conditions. The chairman and a majority of the committee's members are to be nominated by the municipality. The members are to represent the County Labour Board, the Employment Service, the municipality, trade unions and the enterprise sector. The role of the social partners is to contribute with their knowledge regarding qualification needs on regional and local level.

Every county also has a Regional Competence Committee, founded in the late 90s and assigned with improving the co-ordination of training programmes from different providers. The committees have representatives from the business sectors, employee organisations, municipalities, universities, university colleges, county councils and labour market authorities and they are expected to become an important source of information in the planning of vocational education. Their main

tasks are to identify areas where there is a risk for a shortage of labour and to provide recommendations regarding long term education and qualification measures based on the regional and local labour market needs. Some competence committees focus on labour market training whilst others concentrate on guidance, general education supply, or internal activities within the world of work, addressing qualification needs. In some counties the committees function mainly as a meeting point, collecting and distributing information, between different actors. In other counties they have a more active role in the identification of future areas where there are risks for shortages and bottlenecks. In 2000, the competence committees were assigned the task to map the existence of bottlenecks on the regional labour markets. Their analyses have been frequently used as reference material on congresses or information material to different target groups with the aim to highlight education and recruitment needs. AMS states that the county labour boards should co-operate with the Regional Competence Committees in order to have access to the financial resources related to the pilot project on training of employed within occupations with staff shortages.

Supply adjustment – institutional framework, strategy and measures

The AMV is a nation-wide organisation with a 'one-stop shop system', which means that all measures are available through the same organisation. Within their budgets the local PES offices have access to all labour market policy programs. There are employment offices in nearly all municipalities. Many of the larger towns and cities have specialised employment offices catering to specified occupational categories, e.g. technology, industry, caring services, economics and the arts.

Labour market training

The majority of persons within the labour market reserve have upper secondary school qualifications, and this is where labour market policy could play an important role to enhance the supply of labour. Training is the most important active labour market policy demanded by the market and the Swedish Government highlights its role as an engine for growth. Those who are unemployed or risk unemployment and apply for work at the job centre can be referred to Employment training as from 20 years of age. Training courses are to result in employment and are therefore vocational. The purpose of the programme is to improve the chances of those seeking employment to obtain a job and to be an efficient instrument in the matching process by providing suitable skills and have a strong focus towards occupations where demand arises. Consequently, labour market training should be suited both from the perspective of the individual and the general labour market. The training should focus on sectors with labour market shortages and the decisions related to tendering of employment training should be based on the demand for vocationally trained labour, the job seekers' educational needs, and the supply of vocationally

educated labour from the regular education system. The identification of training needs and tendering of labour market vocational training is mainly based on the forecasts carried out twice a year by the county labour boards.

The flexibility in terms of contents and the focus on labour market needs are two characteristics that separate vocational labour market training from general education. Employment oriented labour market training dominates within labour market training (63 percent of total in 1999), and it is notable for its rapid mobility between areas and keeping pace with changes on the labour market. Training time depends on the employment seeker's background and the type of training. The county labour boards and employment offices purchase various training packages from, for example, municipality adult education (komvux), commercial training companies or the AMU Group.

Assessment of labour market training

The national aim is that 70 percent of the participants should be in employment 90 days after exiting training but there are no aims related to the supply of certain qualifications. The participants are followed-up in a way that allows for identification of destinations into employment after leaving the measure. More detailed follow-up methods are applied to evaluate to what extent a certain program leads to employment within a certain sector/occupation. This allows for identification of destinations into employment by training field, 3 months after leaving the measure (in the Händel database). Within the so-called six-month evaluations, it is evaluated to what extent the participants have been employed within the occupation that the training was aimed for. The measurement is based on the judgement of individuals in employment whether or not they work within the same occupation as the focus of the training course. The individuals chose between three alternatives: *within*, *close*, and *other occupation*.

Training towards occupations with staff shortages

During 2000 the AMS pursued a pilot project with labour market training for the employed with the aim to supply the labour market need for qualification in areas where there are potential risks for staff shortages.[26] This can be made through increased qualifications within the frame for the current occupation or through a change of jobs. The pilot project was managed, administrated and followed-up by the AMS. The planning phase also involved the County labour boards, the regional competence committees, local PES offices, as well as workers' and employers' organisations. The follow-up survey suggest that the unions role in the planning of

[26] The County labour boards and the regional competence committees defined the fields of training based on demand situation, supply situation, quality insurance of the education, aims and expected results

the education was relatively unimportant, with close to 70 percent of the employers stating that the unions' role was passive whilst only 14 percent indicating that they played an active part.

In the basis for the AMS budget during the period 2004-2006, the AMS proposes that the opportunity to provide training towards occupations with staff shortages should be extended. The rationale is that vocational transformation is likely to increase due to structural changes on the labour market and demographic developments. The AMS argues that this calls for a broader focus of labour market training comprising recruitment chains within and between companies and authorities. The proposal is that all jobseekers, not only the unemployed, under certain circumstances should be offered the possibility to attend vocational education at upper secondary education level within regular education, where the demand for labour is significantly higher than the supply under the condition that corresponding education is not available on tender. Currently, this type of training is only available for the occupationally disabled and long-term registered immigrants.

Vaggarydsmodellen – A method for company-based labour market training

In some parts of the country there is a relatively new type of company based labour market training, which is based on the local labour market needs and underlines the close link with the companies in the region. The normal procedure starts with the local PES office contacting companies in the region in order to map the interest for company-based training. Before the start of the training, the companies come together with the PES office and assess the type of qualifications a person should possess after the education. When the needs are identified and training plans have been made, the PES office forms a steering group comprising of representatives from the PES office, the companies and a training provider. This group is responsible for the final decisions on contents, duration, and the number of participants. Another important characteristic is that the participants rotate between the companies that are engaged in the same course but providing different training elements. The participant stays at one work place between four and eight weeks and should rotate between at least two and maximum five different work places. The training does not provide any formal certificate or similar but the participants receive a letter of recommendation from all companies engaged in the training. The starting point for Vaggarydsmodellen is that a participant is employable when an employer is willing to hire him or her at current market prices. The model is interesting but the programme resources are an insignificant part of labour market training.

Integration of persons with foreign background

In 2000 the Government initiated a training effort aiming to integrate persons with foreign background into the labour market with a focus on occupations where there

are significant staff shortages. Some of the occupations were identified by the Government e.g. physicians, nurses, technicians, natural scientists, and teachers whilst the AMS should suggest further occupations. In the preparations for this project, the AMS was also assigned the task to map foreign competences within occupations where there is a shortage of staff, in particular bilingual caring personnel. For the judgement of occupations with staff shortages, the AMS used its internal forecasts and the jobseekers comprised of those registered at the local PES offices. Most counties mention physicians, nurses, technicians, and engineers with Master's degree as occupations with shortages where it is most important to carry out complimentary training efforts for persons with foreign higher education qualifications. One third of the counties also highlight construction workers and personnel to the manufacturing industry. For the period 2001-2003 the AMS has received further funds for efforts on complimentary training for persons with non-utilised foreign qualifications, in particular within occupation sectors with staff shortages. The AMS efforts are primarily focused on unemployed persons with foreign higher education qualifications. The contents and aims of complimentary education are planned in cooperation between measure co-ordinators, employers, authorities, and the County labour market board.

In the basis for budget concerning 2004-2006, the AMS proposes to introduce a support for work place introduction in order to improve the establishment of work competent immigrants. The support should be applied when ethnical background is an impediment for labour market integration and it should primarily be used for recruitment within sectors experiencing a shortage of labour. The support should be financed within the budget for labour market training.

On-the-job training

On-the-job training can be used for three purposes: bottleneck training (i.e. training for skilled jobs where there is a shortage of skilled personnel), introduction of new technology (i.e. work organisation) and training of potentially redundant workers who would otherwise run an imminent risk of being laid off. Training takes place outside the company.

Information and vocational guidance

The Labour Market Administration has 6.500 placement officers, stationed at 325 employment offices throughout the country. Often there are specialists in branches, trades, occupations etc. within the local labour market to turn to and many of the larger towns and cities have special public employment offices, e.g. for Technology and IT, Economics and Finance, Arts and Media, Tourism and Shipping, and Constructing and Transport. In the basis for the budget 2004 – 2006, the AMS proposes an increase in the personnel working with job-brokerage in order to

improve and speed up job search services for refugees and other immigrants. The proposal is to finance this additional effort through a reallocation of funds within the total budget for the National Labour Market Board and it should thus not imply any additional costs. Another service is provided by Infoteket, which is an information and guidance centre for education and employment, which is run by the public employment services and the administration for higher education in order to promote the development of labour. Everyone above the age of 18 can receive guidance considering university, university college, adult college, vocational training, and adult education.

The Employment Service also provides powerful self-service tools on the Internet for matching purposes and the Employment Service website on the Internet (www.ams.se) is by far the most frequently visited official website in Sweden (AMS 2003a). At this website, members of the general public can access a wide spectrum of tools facilitating tracing and applying for jobs and of presenting oneself to employers in search of manpower. There are also many other things which jobseekers can do, such as downloading information about occupations and training paths and testing their interests in order to canvass suggestions regarding occupational choice. Other new functions were added to the website in the course of 2002, such as “Where are the jobs?“ which is a service offering a wide panorama of the job market at both national and regional levels. Based on forecasts by AMS and the County Labour Boards, it presents among other things the 30 occupational categories where demand is currently highest. This service has quickly grown popular, attracting something like 150.000 visits per month (AMS 2003a). The information on education paths for 500 occupations includes descriptions of qualification requirements and how to obtain the necessary skills. The section on future prospects discusses issues such as structural changes, internationalisation, labour demand, staff shortages, and future qualification needs.

Further examples of Labour Market Policy interventions

Wage subsidies combined with health care[27] training

The AMS has initiated a pilot project between 1st June 2002 and 31st May 2004 offering Wage subsidies in combination with health care training. The aim of this programme is to address the shortages of qualified basic personnel within health care, whilst offering the unemployed the opportunity to replace those on training. The municipalities and the county councils or their sub-contractors providing health care, elderly care, and care for the disabled can employ the measure. The employed person should participate in training related to health or social care during a maximum period corresponding to nine months of full time studies.

[27] Health care comprises of health, dental care and support service sectors

Mobility allowances

Low travelling costs making commuting profitable for workers, in particular construction workers, is seen as an important factor in order to maintain the labour force in work when there are regional differences in labour demand. Hence, mobility allowances could contribute to a more efficient utilisation of the labour force. There is a recent parliament decision to provide mobility allowances for weekly commuting as a pilot measure from 2002. The allowance is restricted to unemployed finding a job in regions experiencing labour shortages, and who have an occupation characterised by high unemployment in the home community.

Facilitating re-entrance of contraction workers

Two social partner organisations within the construction sector[28] have started a project together with AMS that aim to facilitate the re-entrance for young construction workers that were forced to leave the branch during the 1990s. The aim of the project is to improve the age structure within the branch and to utilise construction work force more efficiently. The project is called Stjärnhimlen ('The starry sky') and is composed of several sub-projects with different focus. One of them is a job rotation project where the construction companies offer their personnel further training with maintained wage, whilst an unemployed person is offered employment. Another sub-project intends to co-ordinate different public efforts affecting employment within the construction sector in order to carry out these activities with optimal employment effect. A third sub-project aims to improve the knowledge transfer from older construction workers with long experience to the younger workers. The idea is that the older workers should function as supervisors for the young. The project is based both on public interventions and branch organisation responsibilities, regional construction committees carry out the co-ordination work at county level. On the central level, there is a steering group composed by one representative from each of the social partners and the National Labour Market Board.

Government incentives to improve the supply of health care[29] personnel

During spring 1998 the Government took an initiative forming a commission for recruitment of personnel to the health care sector. The commission presented several proposals for measures responding to the forthcoming shortage situation within health care occupations. One proposal was to increase the capacity for new entrants in the nursing education and another was to offer part time unemployed within the sector full time contracts. In addition, the commission discussed organisation and leadership issues as well as measures to increase the number of

28 Sveriges Byggindustrier och Svenska Byggnadsarbetareförbundet

29 Health care comprises of health, dental care and support service sectors

immigrants working within the sector. The Government is also currently exploring the possibilities how to improve the supply of health and social care personnel with adequate qualifications. Nine authorities have been assigned the task to develop a common plan for the qualification supply in the sector.[30] Their task is to analyse how public regulations and other management tools affect the potentials for qualification supply, the final strategy should be submitted in May 2004. The activities within the framework of the assignment include mapping of the current knowledge situation, description and analysis of Government regulations and measures, own studies and dialogue with interested parties. Discussions with labour unions, users' organisations, employers' organisations, municipalities and county councils, and universities and university is an integrated part of the assignment.

Addressing part-time unemployment

The Government has initiated an effort to decrease part-time unemployment within the whole economy. The effort comprise 100 million SEK for the period 2002-2004 that should be used to develop the competence of the part-time unemployed, distribute information about good practices where work organisation could facilitate full-time employment, and to support changes in work organisations. The active co-operation of the County Labour Boards and employment offices with municipalities and union organisations is a central factor in this work. It is a long-term processes, with employers and employee organisations assuming greater responsibility for tackling under-employment at workplace level. During 2002 the initiative was gradually extended to other sectors besides nursing and caring services. During the year AMS also collaborated with the Swedish Work Environment Authority, the National Institute for Working Life, the Equal Opportunities Ombudsman and the Swedish ESF Council.

Provide adequate qualifications for non-qualified teachers

Several special measures have been taken to address the pressing immediate shortage of teachers. One recent example aimed at providing adequate qualifications to non-qualified teachers working in public schools. The measure is a result of a co-operation between the Ministry of Education and Science, the social partners, and school representatives. The general strategy of the programme is to combine part-time studies with part-time work at the school. During the first two years of this project, 200 non-qualified teachers received a teacher degree. The Government has now widened the project and during the 2002-2006 period the number of qualified teachers should increase by additionally 4.000 persons. (Ds 2002)

[30] The National Labour Market Board, The Swedish Work Environment Authority, The National Agency for Higher Education, The Swedish Integration Board, The Swedish Migration Board, The Swedish Agency for Advanced Vocational Education, The National Social Insurance Board, The National Institute for Education, and The National Board of Health and Welfare.

3.6 Competence Development for Employees Within European Social Fund Objective 3

The Objective 3 programme is to be a complement in supporting and developing the national policy to achieve its objective of promoting high growth, increased labour force participation, and decreased unemployment. The Swedish Objective 3 plan gives greater emphasis on skills development of the employees than any other Member State. “Compared to the previous Objectives 3 and 4, the new programme presents a major shift towards skills development of the employees in enterprises. Skills development of the employees accounts for over the half of the funds. It is a follow up of the developments in the labour market and is based on the successful Objective 4 and on tripartite agreement between the Government and the social partners…” (http://europa.eu.int/comm/ employment_social/esf2000/ms/s-obj-3-doc-en.pdf)

Government management and responsible institution

The overall aim of the council’s activities is to strengthen the position of the individual in the working life in order to contribute to growth and increased employment. The specific objectives for the competence development (priority 1) within objective 3 concerns the number of analyses of competence needs, the number of competence development measures, and the number of developed networks among small firms and self-employed. It is the Swedish ESF council that is responsible for the European Social Funds in Sweden. Upon the demand of the social partners it was separated from the framework of the National Labour Market Board to be an independent managing authority. This should guarantee the participation of the social partners. As the Managing Authority, the council’s tasks are to co-ordinate, monitor, follow-up, and evaluate overall every day functioning of the programme together with the Monitoring Committee at the national level. The National Labour Market Board (AMS) as the paying authority is responsible for revision and financial reporting to the Commission and for payments to the project owners. AMS is also responsible for auditing and control.

Supply adjustment – institutional framework, strategy and measures

Competence development includes two measures ‘Support for analysis of the competence development and support for the competence development’ and ‘General stimulus for skill development’. The measures are directed towards employees, private and public enterprises, self- employed, and co-operatives. The priority emphasises that competence development should be analysed in order to define competence requirements (measure 1). This is a prerequisite for participating in the general stimulus (measure 2). Within the framework of priority 1 there is also a

possibility for small firms and self-employed to receive support for the development of networks.

The ESF programmes are administrated in co-operation with various interest groups in order to ensure a broad influence on the activities, which in turn should guarantee good quality and high performance. The regional units of the ESF Council take all decisions concerning programme resources. These units support to the Regional Partnerships, which are built on the basis of the former Objective 4 regional partnerships. There is one national partnership and 24 regional partnerships throughout the country. The regional partnerships participate in forming the regional plans, which compose the foundation for the regional activities. The implementation of Competence development for the employees is highly decentralised to the county level with a strong involvement of the social partners in the implementation. There must be a prior agreement with the social partners, or between the managers and the personnel, before support can be accepted.

3.7 Adult Education

Adult education in Sweden is an extensive institution based on a long tradition, and it has a specific responsibility to reach those with the lowest qualifications. Nevertheless, adult education is provided in many different forms and under many different auspices, ranging from national or municipal adult education to labour market and staff training and competence development at work. This section concentrates on municipal adult education and popular adult education, which provides qualifications required for higher education or that serve as an alternative for employees in the need of competence development.

During the spring 2001 the Swedish parliament formulated the aim and national strategy for adult education in a society characterised by life long learning. Focus was shifted from education in school-like forms towards a more flexible support for individual learning. Contents, time, and form should be adjusted according to the needs and desires of the individuals, which implies that learning demand will be the central basis for adult education. The importance of finding forms of co-operation for closer links between the formal education system and the work place is underlined. Society, the employers, and the individuals together are responsible to ensure adult education offers general as well as specialised education in accordance with the needs of different individuals and groups.

As a response to the significant changes in the world of education, the Government decided to set up the Swedish Agency for Flexible Learning (Nationellt centrum för flexibelt lärande, CFL) to meet the needs of those who organise training for skills development and advice. CFL was established in January 2002 and

promotes the development and utilisation of flexible learning in municipal adult education, liberal adult education and in the working world. CFL works for increased accessibility of education and learning for adults, partly through distance learning aimed at adult students, and partly through developing methods, organisations and technology for popular adult education and municipal adult education. This is done by giving information and counselling to increase knowledge about teaching materials and working methods, assisting to raise the pedagogical and methodological levels of personnel, supporting development projects, and working with dissemination of information about Swedish and international research and development.

Municipality run adult education

Municipal adult education (komvux) is intended to provide a basis for participation in life in the community, working life and further study.[31] It is composed of basic adult education, upper secondary adult education, and continued education. Upper secondary education for adults aims to provide the same qualifications as upper secondary education for the young. However, the courses may be different as regards emphasis, content and scope. A significant share (approximately 15 percent) of all students leaving upper secondary education enters municipal adult education the same year.

Continued education is a form of post-secondary education with vocational focus, which is provided within municipal adult education and at the National Schools for Adults[32] (SSV). The objective is to provide further training for a higher position within a profession or for a new profession. The majority of the programmes take between six months and one year to complete, and they focus on subjects such as economics, computing or tourism. The studies are generally formed with the local labour market situation as a basis in co-operation with representatives from business life on local and central level, although the NAE has formed a number of national continued education programmes.

Government management and responsible institutions

The National Agency for Education is responsible for the management of the public school system and thus for municipal adult education.[33] Municipalities and County

---

31 In addition to municipal adult education (Komvux) the public school system for adults includes education for adults with learning disabilities (Särvux) and Swedish for immigrants (SFI).

32 Sweden has two, one in Norrköping and one in Härnosand. The schools supplement adult education for those unable to find suitable komvux opportunities in the location where they live. Parts of the teaching are in the form of distance learning. In addition, the students visit the SSV schools at regular intervals for tutored instruction.

33 Information about the National Agency for Higher Education is included in the section accounting for upper secondary education.

councils are responsible for the implementation of public adult education but the latter only provide adult education within the field of natural resources. These responsible institutions have the possibility to contract out the education to external provides. The experiences from the adult education imitative shows that the municipalities formed different local solutions and their role has shifted significantly from being a mere training provider to more co-ordinating function comprising of information, recruitment and guidance activities. The municipalities have also developed a well functioning collaboration with other actors such as liberal adult education and private education providers (Proposition 2001/2002a). Municipal adult education is totally funded by the municipal budget, which consists of state grants and local tax revenues. National Schools for adults are financed by the State and the Adult Education Initiative are funded by the State.

Supply adjustment – institutional framework, strategy and measures

The basis for all municipal adult education is the individuals' needs, desires and potentials but the local labour market should also be taken into consideration when the education supply is formed. The students are also free to choose their own study programme and they can also combine studies at compulsory and upper secondary level. Collaboration over policy areas and collaboration between authorities, the social partners, and the popular movements should be the strategy to realise the individuals' learning and competence development. According to the commission on the adult education (SOU 2000:28) the desires of the individuals were very important for the planning of this type of education in 75 percent of the municipalities. The influence from the local public employment offices was also relatively important in 64 percent of the municipalities whilst the voice of local employers appears to have been relatively limited. Nevertheless, it can be observed that the municipalities in general make use of their independent role as education planner, which implies that the vocational programmes within municipal adult education are very much targeted towards the needs of the local labour market. In recent years this has steered education supply towards IT and health care.

The Adult Education Initiative

The traditional supply of general education has been complemented by a significant increase of vocational training within the Adult Education Initiative (AEI), which was the most significant effort ever within Swedish adult education. The AEI comprises upper secondary adult education and it implies that the Government finances around 100.000 full-time students through a Government grant. All communities were participating in this project over 5 years, introduced in July 1997. The main target population in Adult Education Initiative is unemployed adults that partly or completely lack three years of secondary education. The aim was both to improve employability for these persons as well as to increase the supply of qualified labour in order to

improve the prospects for economic growth. Nevertheless, it was the individuals' demand that should decide the form and content of all education within AEI and the labour market needs is a secondary aim. There were also possibilities to combine courses with active labour market programs or to obtain special knowledge required for higher education. The state and the municipalities share the responsibility for the AEI. The source of finance is state contributions but each municipality is responsible for organisation, planning, and implementation. Municipalities, county councils, CFL, study associations, adult colleges and training companies co-operates in order to provide the broadest possible supply of courses

Popular adult education

The publicly supported popular education is organised in ten study associations and 147 adult colleges (Swedish Folk High Schools). The overall object of liberal adult education at the adult colleges is to give general civic education. There are many courses to choose from, varying from a couple of days to several years. There are also 147 adult colleges scattered around the country, 99 of them are run by popular movement organisations, and 48 by the county councils and the regions. Each semester they have around 20.000 students enrolled in their longer courses and about 80.000 enrolled in their shorter courses. The minimum age for admission is 18 years and the courses are suitable for those who have not completed their secondary education or for those who want to go on to further education. A certain interest has been directed towards groups with special educational needs, e.g. people with short basic education, people with various disabilities and immigrants and the unemployed. Nevertheless, the adult colleges also provide some education that in form and contents corresponds to those offered within the framework of AVE.

Adult college courses, study circles and cultural activities organised by adult education associations are intended for all kinds of people and cover a wide variety of subjects. The course content in adult college education covers a broad spectrum of subjects, with social studies, language and science as the main fields. In addition to the general subjects the student may also choose an optional special course such as computing, music, sport, art & design etc. The majority of the adult colleges offer a wide range of special courses. Among such courses one can mention the aesthetic courses (art & design, painting, weaving etc), music, journalism and studies concerning the developing countries. Some schools provide vocational training for various leader/instructor categories, e.g. youth and recreational leaders and drama leaders.

Some of the special aims of popular adult education are stated by law but there are basically no rules - neither on how popular education should be organised nor regarding its content. The management by objectives applies also to the popular education activities, which are subsidised by the state. The Council for Popular Education is responsible for the coordination, distribution of state grants and

evaluation of popular education activities. Popular adult education is largely financed by means of support from the state, county councils and municipalities. In addition, they have incomes from educational activities organised on a commission basis.

The Government states that liberal adult education is a national responsibility that should be shared between the state, the county councils, and the municipalities. The Swedish National Council of Adult Education is responsible for the allocation of state grants and for evaluation of the adult college education. The Council was founded in 1991 as a non-profit organization with three members: The National Federation of Study Associations, The Federation of County Councils, and The Interest Organization for Popular Movement Adult colleges (RIO). The council should promote popular education through contacts with universities, university colleges, authorities and other organisations. Next to liberal and general education, competence development is one of the central objectives for the council's activities. The co-operation with the National Labour Market Board and the County Labour Boards was further developed during 2002 through the agreements on the specific means for education of persons within the labour market policy programme; 'the Activity Guarantee'. A characteristic feature of the adult colleges is, among other things, their freedom to develop the content and direction of their own courses. There is no centrally established, standard curriculum and each school makes its own decisions regarding teaching plans within the limits set by a special ordinance.

Folkuniversitetet

Folkuniversitetet is an adult educational association that offers a wide range of adult education all over Sweden. A large part of the training offered by Folkuniversitetet targets people who need new knowledge and skills to apply in professional and/or labour market contexts. Folkuniversitetet also provides education targeted towards the employed, which leads to a diploma within occupations such as real estate administration, business assistant, sound technician, and IT support specialist. Folkuniversitetet is an association of five foundations: the extra-mural departments attached to the universities of Stockholm, Uppsala, Göteborg, Lund and Umeå. Folkuniversitetet is independent of all political, religious and trade union interests. The links between Folkuniversitet and the universities provide, through lectures, study circles and seminars, offer information about the latest developments in research. Folkuniversitet also engage academic staff in offering university-level courses in a wide range of subjects. A large part of the training offered by Folkuniversitetet targets people who need new knowledge and skills to apply in professional and/or labour market contexts related to the rapid changes in the labour market. Government services, public authorities and the business sector also turn to Folkuniversitetet for assistance with specialised training courses.

4 Recent Trends

The adjustment of education dimensions according to the needs of the labour market is a frequently reappearing issue. There are also frequent evaluations linking the supply adjustment process with the needs of the labour market. This report is restricted to describe the Swedish efforts to supply the labour market with adequate qualifications, whilst assessment is outside the scope. Nevertheless, it is interesting to regard some developments related to the outcomes of these efforts. This section presents a few examples of developments that have been highlighted in recent evaluations.

Broader upper secondary education and increased post-upper secondary vocational education

The committee assigned to evaluate upper secondary education (SOU 2002) states that today's labour market requires broader and deeper professional skills than what is offered within upper secondary education. Close to all (98 percent) compulsory school pupils continue at upper secondary level, and the aim is that 50 percent of each cohort should start higher education studies. Under such conditions preparation for higher education must be an important part of upper secondary education. Consequently, there will be less room for specialisation, which calls for an expansion of shorter post-upper secondary professional degrees. The committee also projects that an increasing part of vocational training will be post-upper secondary in the future.

More use of locally arranged adult and upper secondary education

The trend within adult education is that the municipalities make more and more use of the possibilities to arrange local study paths and courses, and their share within adult upper secondary education doubled between 1997 and 2001. The Government welcomes this trend to development new competences on a labour market characterised by swift changes. (Proposition 2000/2001) During autumn 2001 there were locally provided branches at 170 upper secondary schools and local study paths at 104 schools. Another illustration of this trend is that the total number of students participating in local branches and study paths at upper secondary education level doubled between 1995 and 2000/2001. (Skolverket 2002a) A local study path should be linked to a national programme and initiated in order to provide a qualification need, which is not covered by the nationally decided study paths. The rationale of local courses is to allow for deeper knowledge or specialisation within a certain subject, and the national programmes of upper secondary education include a wide range of local courses. The most popular courses were such that related to the occupational focus of the programme. One example is the 'Food programme', where over 7 percent of the final

marks in 1997 referred to locally arranged courses. Other courses are created to assist pupils with special needs.

Upper secondary education according to the demands of the individuals

Over 80 percent of the applicants to upper secondary education for the school year 2000/2001 were accepted to the programme they applied for as their first choice. The highest share (92 %) was found within the natural science programme. The programmes with the lowest shares were handcraft (53 %) and the media programme (68 %). (Skolverket 2002a)

Educational and occupational orientation in upper secondary education

An investigation initiated by the Swedish Government in 2001 (SOU 2001a) reveals that 70 percent of the pupils in upper secondary school never or very rarely received educational and occupational orientation at school. Eight out of ten teachers state that they never or only occasionally link their education to labour market issues. Another dissatisfactory finding in the investigation is that only a minority of the students has made a visit to a company, or been visited by a company representative. This indicates that today's upper secondary school pupils are poorly equipped before the educational choices throughout the school system. Nevertheless, according to NAE (1999) the students' demand patterns correspond very well to changes in demand on the labour market. [34] Thus, further adjustment of upper secondary education dimensions according to the demands of the students would enhance the adjustment between the educational dimensions and the labour market demands further, according to the agency. HSV (1999a) argues that students within upper secondary education have not adjusted their choices in accordance with the needs of the expanding higher education. If this pattern does not change, recruitment to higher education will depend on adult education and technical foundation year.

Work after upper secondary education

The evaluation 'Efter skolan' (After school) reports on the activities of the young after completing upper secondary education. In summary it can be concluded, that many students in programmes without work-place learning are studying three years after completed education. Relatively few have a job, and few of those employed were working within their field of study. Regarding the vocational programmes, over 70

[34] The conclusions are mainly based on an analysis of the number of applications and approved applications to the programmes for industry, electricity, construction and care in comparison to the employment changes within corresponding sectors during 1987-1998.(Skolverket 1999, Skolan och den föränderliga ekonomin, rapport)

percent of the students have a job, and 40 percent answer that their job is linked to their education. The most common jobs three years after completed education were health care (18%), machinery and manufacturing (11%), salesmen in retail (9%), construction (8%), and office work (8%). The evaluation also shows great differences between programmes. The highest share of youth working within their field of study was found within health care (83 % of the women and 69 % of the men).

Education dimensions related to health care[35]

The problem related to staff shortages in the health care sector varies between different types of occupations. Motivation rather than under dimensioned capacity appears to be the main problem concerning upper secondary school qualifications. Currently, a considerable majority of the employed within the health care sector has received their education from municipal adult education. In contrast, there is relatively high interest for health care education within higher education and the number of applicants exceeds the available places. As a response, future expansions within higher education will involve caring and teaching education.

Higher education expansion

Higher education in Sweden expanded significantly during the 1990s and, more resources have been allocated, in particular since 1996/97. The number of full time students in higher education was 80 percent higher in 2000 than one decade earlier and only between 1997 and 2001 higher education places increased by 80.000 persons. HSV (2003) explains that the development during the 1990s was characterised by expansion not only in terms of students; the number of graduations also increased by 35 percent to around 40.000 per year. In addition, the average length of studies leading to graduations has increased from 2,7 to 3,7 years. Teaching, nursing, University Diploma in Engineering, and Master of Science in Engineering are among the fields where there has been an expansion in terms of graduations. Regarding the two latter this corresponds to an increase of 100 percent (Master) and 40 percent (Diploma). Other expanding programmes include the more general programmes leading to Bachelor's and Master's degrees. Nevertheless, the significantly increased capacity also resulted in a lack of demand for places in maths and natural science programmes. The Government allowed universities and university colleges to reduce the number of students within these fields in order to increase the capacity in the subject areas where there is a strong demand, e.g. the arts, the social sciences and law.

[35] Health care comprises of health, dental care and support service sectors

Higher education objectives

The aggregated number of applicants for higher education by far exceeds the number of places available. However, the expansion of undergraduate programmes during the 1990s and a simultaneous reduction in demand has led to empty places in some programmes. There are great differences between different types of education; some programmes have 10 applicants for every place on offer, whilst others are admitting all those applying without filling all available places. Regarding the specific graduation targets set out in 2000, it was only the number of masters' degrees that was fulfilled. The target achievement for engineers and architects, and for pharmacist was also relatively high (above 90 percent). The outcome regarding upper secondary teachers was 81 percent of the target, and concerning compulsory school teachers (grades 4-9) it was only 58 percent. (Ds 2002)

Commissioned education at universities and university colleges

In a study regarding commissioned education by the Association of Swedish Higher Education (SUHF), it is reported that this type of education comprised 5.400 students during 2000. The customers are still concentrated to the public sector, mainly towards programmes within caring and teaching. Revenues during 2000 amounted to almost 1 billion SEK, which on average corresponds to 5 percent of the revenues for basic education for a university or university college. (HSV 2002c)

Promising results from AVE

The aggregate results from AVE show that a majority of the graduates (82%) had a job 6 months after leaving the education. Approximately 80% of them were working, with regard to their educational focus, within a 'target' field of profession. Distributed by educational focus of training, the results show that graduates trained within IT, transport and healthcare are those with the highest proportion of graduates working within a target profession. Approximately three quarters of those employed or self-employed consider that the AVE contents corresponded to their competence demands. One-fifth of those questioned stated that the training within AVE did not meet their expectations. (Lindell, Johansson 2003)

The PES is service minded but too volume focused

The Confederation of Swedish Enterprise delineates a picture of the PES as open and service-minded, however, without adequate knowledge about the companies' needs. The criticism from Swedish Enterprise is concerned with job brokerage, which is considered as the most important task of the PES. The main problem, according to Swedish Enterprise, is that the local PES offices have been too much focused on the

activity guarantee and the long-term unemployed. As a result, more and more of the regular contacts with companies have been carried out over the Internet. Swedish Enterprise also directs criticism towards labour market policy during the 90s for being too focused on volume and general training such as the Adult Education Initiative. This has been done at the cost of more specialised training towards specific occupations. (Svenskt näringsliv 2001a, 2002)

Changed focus of labour market training

During recent years the Government has emphasised the importance of the vocational training component within labour market training. The employment requirement has been intensified through the introduction of the objective stating that 70 percent of the participants should be in employment 90 days after leaving the programme. The AMS also states that focus of labour market training has moved away from being volume oriented towards more qualitative programmes during the 1990s. There has also been a shift from re-training towards efforts to upgrade competence. Nevertheless, the share of preparatory training programmes has continued to account for around one third of all contracted out training. (Ds 2000)

First vocational training through labour market training

Studies by the local PES offices suggest that the unemployed and the inactive generally lack the qualifications required to match the vacancies within many occupations. One major problem is related to the level of education rather than the type of education, as the non-employed supply of labour with higher education qualifications is insignificant. The lack of qualifications among registered unemployed is also identified as one of the reasons for the difficult recruitment situation within municipality occupations. A majority of the potential labour supply has upper secondary school qualifications. It is foremost within occupations demanding this type of qualifications where labour market policy can play an important role to improve the supply of jobseekers. To a larger extent, first vocational education is attained from labour market training, in particular among the young. This trend seems most visible regarding training focused on industrial work, health care, computer technology, and the general caring sector. (AMS 2002h)

Labour market training is focused towards occupations with a shortage of labour

In recent years, courses in technique/computer science, manufacture, service and medical health care have dominated within labour market training. During 2002 the focus towards manufacturing, and health and social care was re-emphasised. AMS (2002h) recognises that it is important that this focus is continued and broadened in order to respond to the increasing shortages within these sectors. A comparison

between the dimensioning of labour market training programmes and the AMS labour shortage index, shows that 63 (70) percent of the participants in May 2003 (2001) participated in training programmes with focus towards occupations with staff shortages.

Demand for qualifications received through labour market training

A survey by the Confederation of Swedish Enterprise analysed the impression about labour market training among 80 enterprises with 5-199 employees. The survey showed that during the past two years, 44 percent of the firms had employed an individual coming from labour market training. Nevertheless, over 70 percent of the companies state that they never or rarely recruit persons from labour market training programmes. Among those enterprises that had hired someone from labour market training, only 7 percent stated that the training influenced their choice. According to an AMS study in 1998, 30 percent of the employers would chose someone from labour market training, given the same qualifications. Four out of ten employers would not know whom to employ, and one could not answer the question. Evaluation by the AMS in 1999 showed that 3/4 of the labour market training participants were working within, or close to, the occupation they were trained for. Between 1992-1996 the percentage varied between 71 and 73 percent, which were the lowest ever reported since the measurement started in the late 70s. More detailed analysis reveals variations between occupations: In 1998 relatively few participants in training within administration worked within a 'target occupation', whilst health care training was the most successful type of training in terms of targeting. (Ds 2000)

Ambiguous results regarding labour market training towards occupations with shortages

The pilot project with labour market training for the employed towards occupations with shortages had a strong focus towards manufacturing; close to 50 percent of the participants took part in training linked to different craftsman occupations and machine operating. The share of training towards the health care sector was fewer than planned. IT training was mainly provided on a very advanced level e.g. programming and system analysts, and technology training was primarily focused on machine technology. Recent assessment of the programme reveals that less than half of the participants had more qualified tasks after the training. This relatively low figure is probably partly due to that the participants previously were under-qualified for their activities. The employers are generally more positive to the training than the participants. Several employers state that the pilot project has hindered problems related to shortages and bottlenecks. (AMS 2002f)

5 Summary and Concluding Remarks

The theme of this report has been to describe some of the principal efforts in Sweden, which aim to identify and tackle non-satisfied qualification need. The discussion focused on *types* of qualifications, understood as qualifications related to a certain occupation or education group. The primary purpose of the first section was to describe the principal labour market projections in Sweden. A secondary purpose was to demonstrate the availability of recent forecasts and relevant reference statistics. There is a long tradition of making regular projections of qualification needs in Sweden. Among the various institutions engaged in such projections, Statistics Sweden and the National Labour Market Administration stand out as the main providers. These two institutions carry out short- and long-term forecasts on a regular basis. The short-term (1–3 years) forecasts offer up-to-date and straightforward information about employment outlooks, mainly based on interviews with employers, for the following 1-3-year period. The long- (15–20 years) and medium-term (8 years) forecasts analyse the flows through the education system and to the labour market. They are based on the population and labour force surveys, and a wide range of assumptions about economic trend, structural changes, education dimensions, and flow structures. The results are presented in the form of supply and demand by education group (SCB) or by occupation (AMS). Given the relatively strong assumptions, the projections should be considered as indications of what needs to be done to avoid future mismatches, rather than the most probable development. Some principal results from the most recent projections are presented in Section 2. It is revealed that the main short- as well as long-term shortages appear within health care, teaching, and some occupations/education groups related to technology and natural science. There are also several indications of long-term shortages in the construction sector. Section 2 also presented some results from recent analyses concerning the implications of recruitment problems. This appears to be a relatively common practice for employers to lower the qualification requirements to solve the problem, in particular in the public sector.

The adjustment of education dimensions according to the needs of the labour market is a frequently reappearing issue, as is the ability of projections to anticipate long-term labour market needs. Although forecasts cannot be and are not perfect, they provide valuable information for the actors within the system. It is evident that the development within some sectors/occupations is more straightforward to forecast than within others; some sectors/occupations are mainly affected by demographic changes, whilst others are exposed to structural changes making it very difficult to undertake accurate diagnoses. This is reflected in the Swedish qualification supply strategy, where there are very few quantitative objectives linked to long-term labour market needs for specific types of skills. Furthermore, those existing are primarily related to health care and teaching. The main part of the targeted adjustment process responding to specific labour market needs functions as a form of co-operation with the surrounding society. The reports presented several examples of

networks for ongoing contacts between business life and individual education/training providers.

The report emphasises the institutional framework within which the adjustment process take place. Regarding the public education system, this framework underwent extensive decentralisation of responsibilities during the 1980's and the beginning of the 1990's as a goal- and result-oriented steering system was introduced. Since then, the Swedish Government defines the general criteria for the dimensions of the different public education types through assignments, laws, aims or guidelines depending on the type of education. The actual education supply is decided through a wide range of decisions on a decentralised level. Education planning in a de-centralised system entails the disadvantage that public interventions are restricted to certain planning frameworks, graduation objectives and education performances. Nevertheless, this is not to say that there is reason to abandon this system. The dynamics in the local education planning is increasing and it is probably well justified to encourage the adjustments to the local labour market's qualification needs through local decisions, based on dialogues with different actors on the labour market. On the other hand, there are also national problems to be solved and national interests to be looked after, not the least regarding the public sector services and the development of strategic industry sectors. The examples of strategies linked to national needs include the efforts, extending over several types of education/training, to increase the supply of qualifications within the fields of natural science and technology. Other areas where substantial efforts have been made to increase the supply at a national level include the health care sector, as well as personnel within the education sector.

Turning to the individual institutions within the Swedish system, it is evident that they diverge in terms of role and strategy. The task of upper secondary education is to further develop the basic knowledge in order to prepare the students before working life and higher education. Considering the objective that 50 percent of each group should enter higher education, it is clear that preparation for such studies must be an important part of upper secondary education. Consequently, there must be less room for specialisation within upper secondary education. This development appears well in line with the structural changes on the Swedish labour market, and the trend that broad generic skills seem to be of increasing importance, also within traditionally low-skill occupations. Higher education supplies the national labour market with educated persons in order to facilitate companies' recruitment of qualified labour. Nevertheless, the central task is not to calculate future demands in order to provide tailor-made mixture of skills. The decreasing specialisation within upper secondary school calls for an expansion of shorter, post-upper secondary education, professional degrees. The Higher Vocational Education degree can be seen as a response to this demand. There are several potential advantages of such education; the potential to attract persons for whom there are no attractive opportunities within regular higher education, the link to the individuals' previous vocational qualifications as well as to employment opportunities. AVE is another

interesting and innovative post-secondary education on the border between adult education and higher education. This type of education provides training according to the needs of the labour market, and to some extent as a direct result of request from employers. The employment market is to finance the expenses of the workplace-training component of the education. Adult education plays a multiple role in Sweden, comprising of support to those with lowest qualifications, to further training and competence development at work. In terms of the links between general municipal education and the labour market, it is a common practice that the municipalities organise programmes related to local needs.

The framework for labour market policy is also characterised by decentralised management by objectives. The central, regional, and local level within the AMV collaborates in the breakdown of the Government objectives. The local PES offices, ultimately implement the aims set by the parliament and the Government. The prime task of the PES is to help the labour market to run smoothly as a result of job seekers finding employment and job vacancies being filled promptly. Among its instruments, labour market training stand out as the main tool to supply the labour market with the qualifications needed. Recent trends reveal that it is increasingly common that first vocational education is attained from labour market training. Nevertheless, the role labour market policy should be to correct for current and short-term equilibrium and not to adjust according to long-term qualification needs. The identification of training needs is mainly based on forecast carried out at the level of the regions. Another central task of the PES is job brokerage to speed up the matching between job seekers and vacancies. For this task there are 6500 employment officers at 325 employment offices throughout the country and powerful self-service tolls on the Internet. Finally, concerning support for staff training, the report mentioned the strong focus on competence development within the Swedish ESF Objective 3. The strategy emphasises that competence development should be analysed in order to define competence requirements. This is a prerequisite for participating in the general stimulus.

References

AMS 1998, Framtidens Jobb (The jobs of the future) [on-line] Available at: [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2000, Kartläggning av invandrad kompetens (Mapping immigrant competence) (press release) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=276

AMS 2002a, Arbetsmarknadsutsikterna för år 2003 (Employment outlooks for 2003) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002b, Den framtida personal försörjningen inom vård och omsorg - tillgång och rekryteringsbehov till år 2015 (The future personnel supply within health care and nursing - supply and recruitment needs until 2015) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002c, Den framtida personalförsörjningen – Tre scenarier till ar 2015 (The future personnel supply - supply and recruitment needs until 2015) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002d, Den framtida personalförsörjningen inom Bygg och anläggning - tillgång och rekryteringsbehov till år 2015 (The future personnel supply within construction - supply and recruitment needs until 2015) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002e, Uppföljning av deltagare som slutat arbetsmarknadsutbildning andra kvartalet 2001 (Follow-up of participants leaving labour market training the second quarter 2001) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002f, Uppföljning av försöksverksamhet med bristyrkeutbildning för redan anställda (Follow-up of pilot activities with training of the employed towards occupations with shortages) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002g, Var finns jobben 2002/2003? (Where are the jobs 2002/2003?) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2002h, Var finns jobben 2003 (Where are the jobs 2003) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

AMS 2003a, Annual Report 2002 [on-line] Available at: http://www.ams.se/RDFS.asp?A=42105&L=31579

AMS 2003b, Budgetunderlag för perioden 2004-2006 (Basis for the budget during 2004-2006) [on-line] Available at: http://www.ams.se/rdfs.asp?l=31510

AMS 2003c, Den framtida personalförsörjningen inom utbildning - Tillgång och rekryteringsbehov till år 2015 (The future personnel supply within education - supply and recruitment needs until 2015) [on-line] Available at: http://www.ams.se/RDFS.ASP?L=31510

Ds 1999, Den ljusnande framtid är vård Om vård och omsorg - en arbetsmarknad i utveckling (The future is health care - a labour market in development) 1999:44 [on-line] Available at: http://naring.regeringen.se/propositioner_mm/ds.htm

Ds 2000a, (No information on title) Ds 2000:38, Ministry of Industry and Employment [on-line] Available at: http://naring.regeringen.se/propositioner_mm/propositioner/index.htm

Ds 2000b, Samverkan mellan skola och arbetsliv (Collaboration between school and the working world) Ds 2000:72, Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/ds/index.htm

Ds 2000c, Samverkan mellan skola och arbetsliv. Om möjligheterna med lärande i arbeite (Collaboration between school and the working world. About the possibilities of work place learning) Ds 2000:62, Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/ds/index.htm

Ds 2002, Kompetensförsörjningen på arbetsmarknaden (Competence supply on the labour market) Ds 2002:47, Ministry of Industry and Employment [on-line] Available at: http://naring.regeringen.se/propositioner_mm/propositioner/ds/index.htm

Ds 2003, Validering m.m. - fortsatt utveckling av vuxnas lärande) (Validation etc. - continued development of adult learning) Ds 2003:23 [on-line] Available at: http://utbildning.regeringen.se/propositionermm/ds/index.htm

Folkbildningsrådet 2002, Folkbildningsrådets årsredovisning med verksamhetsberättelse 2002 [on-line] Available at: http://www.folkbildning.se/page/12/Dokument

HSV 1999a, Den högre utbildningen och arbetsmarknadens behov (Higher education and the needs of the labour market) [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=664&select_tree=338&view=0

HSV 1999b, Högskoleutbildade – tillgång och efterfrågan (Perosns with Higher Education - supply and demand) [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=664&select_tree=338&view=0

HSV 2000, Hur många utbildningsplatser behövs det i framtiden? (How Much Must the Capacity of Swedish Education Expand to Reach Government Goals?) [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=569&select_tree=320&view=0

HSV 2002a, Högskolans arbete med sin samverkansuppgift, (The work of Higher Education regarding the collaboration assignment) [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=1423&select_tree=458&view=0

HSV 2002b, Swedish Universities & University Colleges, short version of annual report 2001 [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=1423&select_tree=458&view=0

HSV 2002c, Utbildning anpassad efter arbetsmarknadens behov – sa arbetar högskolan (Education adjusted according to the needs of labour market - the approach of Higher Education) [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=1423&select_tree=458&view=0

HSV 2003, Högskoleverkets årsrapport 2003 (HSV annual report 2003) [on-line] Available at: http://www.hsv.se/sv/CollectionServlet?page_id=464&view=0&expand_tree=69

ITPS 2002, Arbetskraftsbrist och arbetskraftsinvandring: Hot eller möjlighet för ekonomisk tillväxt? (Labour shortages and labour immigration: Threat or opportunity for economic growth) A 2002:010 [on-line] Available at: http://www.itps.se/publikationer/publikationer.htm

Landstingsförbundet 2001, Det finns alltid behova av en till, men... (There is always need for one more, but...) [on-line] Available at: http://www.lf.se/ag/arbetsomraden/personal/personal.htm

Lindell & Johansson 2003, Meeting the demand? Students within Swedish Advanced Vocational Education entering the labour market: Reflections from an ongoing research project, European Educational Research Journal, Volume 2 pp 107-125

Proposition (Government Bill) 2001/2002a, En politik för tillväxt och livskraft i hela landet (A policy for growth in the whole country) prop. 2001/02:4, Ministry of Industry and Employment [on-line] Available at: http://naring.regeringen.se/propositioner_mm/propositioner/index.htm

Proposition 2001/2002b, Den öppna högskolan (Reforms in higher education – a more open system) Prop. 2001/02:15, Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/propositioner/index.htm

Proposition 2000/2001, Vuxnas lärande och utvecklingen av vuxenutbildningen (Adult learning and development of adult education) prop. 2000/01:72, Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/propositioner/index.htm

Regleringsbrev (Steering letter) 2002a, Regleringsbrev för budgetaret 2003 avseende anslag till univeristet och högskolor m.m. (Steering letter for 2003 concerning grants to universities and university colleges, etc) Ministry of Education and Science [on-line] Available at:

Regleringsbrev 2002b, Regleringsbrev för budgetåret 2003 avseende Högskoleverket (Steering letter for 2003 concerning the National Agency for Higher Education) Ministry of Education and Science [on-line] Available at:

Regleringsbrev 2002c, Regleringsbrev för budgetåret 2003 avseende Myndigheten för kvalificerad yrkesutbildning (Steering letter for 2003 concerning the National Agency for Advanced Vocational Education) Ministry of Education and Science [on-line] Available at:

SCB 1999, Trender och prognoser (Trends and forecasts) [on-line] Available at: http://www.scb.se/publkat/katLista.asp?area=101;fetchTitle&date=all&selPubtype=all

SCB 2001, Utbildning och efterfrågan på arbetskraft. Utsikter till år 2008 (Education and the demand for labour. Outlooks until 2008) [on-line] Available at: http://www.scb.se/ publkat/katLista.asp?area=101;fetchTitle&date=all&selPubtype=all

SCB 2002a, Arbetskraftsbarometern (The labour market tendency survey) [on-line] Available at: http://www.scb.se/publkat/katLista.asp?area=101;fetchTitle&date=all&selPubtype=all

SCB 2002b, Trender och prognoser (Trends and forecasts) [on-line] Available at: http://www.scb.se/publkat/katLista.asp?area=101;fetchTitle&date=all&selPubtype=all

Skolverket (National Agency for Education) 2001, Swedish work with personnel prognoses for child care, schools, and adult education [on-line] Available at: http://www.skolverket.se/ english/publ.shtml

Skolverket 2002a, Beskrivande data om barnomsorg,skola och vuxenutbildning (Descriptive data on childcare, school, and adult education) [on-line] Available at: http://www.skolverket.se /publicerat/index.shtml

Skolverket 2002b, Redovisning av uppdrag om kvalitetsförbättrande insatser för gymnasieskolans yrkesutbildningar m.m (Report on assignment about quality improvements of upper secondary voacational education) [on-line] Available at: http://www.skolverket.se/publicerat/index.shtml

Skolverket 2002c, Samtal-Samsyn-Samarbete: Ett regeringsuppdrag om arbetssätt för kvalitetsförbättringar inom gymnasieskolans yrkesutbildningar (Discussion - Consensus - Collaboration: An assignment concerning methods for quality improvements of upper secondary voacational education) [on-line] Available at: http://www.skolverket.se/publicerat/index.shtml

Skolverket 2003, Skolverkets arsredovisning 2002 (Annual report for the National Agency of Education 2002) [on-line] Available at: http://www.skolverket.se/publicerat/index.shtml

SOU 2000, Langtidsutredningen 1999/2000 (The long-term projection 1999/00) SOU 2000:7, Ministry of Finance [on-line] Available at:

SOU 2001a, Karriärvägledning.se.nu Sammanfattning och goda exempel (Career guidence.se.nu Summary and good practices) SOU 2001:46 Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/sou/index.htm

SOU 2001b, Yrkeshögskoleutbildning - inriktning, utformning och kvalitetskriterier (Higher Vocational Education Degree - focus, form and quality criteria) 2001:107 Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/sou/index.htm

SOU 2002, Åtta vägar till kunskap. En ny struktur för gymnasieskolan (Eight paths to knowledge. A new structure for upper secondary school) SOU 2002:120, Ministry of Education and Science [on-line] Available at: http://utbildning.regeringen.se/propositionermm/sou/index.htm

Svenskt näringsliv 1999, Utbildning för sysselsättning eller arbetslöshet (Education for employment or unemployment) [on-line] Available at: http://www.svensktnaringsliv.se/Index.asp?PN=6221 &source=dd

Svenskt näringsliv 2001a, Brister i arbetsmarknadspolitiken bromsar tillväxten (Shortcommings in labour market policy reduce growth) [on-line] Available at: http://www.svensktnaringsliv.se /Index.asp?PN=6221&source=dd

Svenskt näringsliv 2001b, Sökes – Framtidens medarbetare (Wanted - Collegues for the future) [on-line] Available at: http://www.svensktnaringsliv.se/Index.asp?PN=6221&source=dd

Svenskt näringsliv 2002, 120 000 jobb till spillo (120 000 jobs wasted) [on-line] Available at: http://www.svensktnaringsliv.se/Index.asp?PN=6221&source=dd

Abbreviations

AEI	Adult Education Initiative
Af	Public Employment Service Office
AKU	The Swedish Labour Force Survey
AMS	National Labour Market Board
AMV	National Labour Market Administration
AVE	Advanced Vocational Education
CFL	Swedish Agency for Flexible Learning
CSN	Swedish Central Agency for Study Allowance
ESF	European Social Fund
FR	Federation of Private Enterprises in Sweden
FTE	Full-time equivalent
HSV	National Agency for Higher Education
IFAU	Institute for Labour Market Policy Evaluation
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
LF	Swedish Federation of County Councils
LFS	Labour Force Survey
LO	Swedish Trade Union Confederation
LUCAS	Longitudinellt register för utbildnings- och arbetsmarknadsstatistik
NAAVE	National Agency for Advanced Vocational Education
NACE	Statistical Classification of Economic Activities in the European Union
NAE	National Agency for Education
NUTE	Swedish Business Development Agency
PES	Public Employment Services
RAMS	Registerbaserade arbetsmarknadsstatistiken
SACO	Swedish Confederation of Professional Associations
SAF	Swedish Employers' Confederation
SCB	Statistics Sweden
SNI	Standard för Svensk Näringsgrensindelning
SOU	Reports of the Government Commissions
SSV	National Schools for Adults
SSYK	Standard för Svensk Yrkesklassificering
SUHF	Association of Swedish Higher Education
SUN	Svensk utbildningsnomenklatur
TCO	Swedish Confederation of Professional Employees
VHS	National Admission Office to Higher Education

Internet links

Confederation of Swedish Enterprise	www.svensktnaringsliv.se
Estia in Sweden	estia.programkontoret.se
European Structural Fund Council	www.esf.se
Institute for Labour Market Policy Evaluation	www.ifau.se
Ministry of Education and Science	utbildning.regeringen.se
Ministry of Industry, Employment, and Communication	naring.regeringen.se
National Admission Office to Higher Education	www.vhs.se
National Agency for Advanced Vocational Education	www.esf.se
National Agency for Education	www.skolverket.se
National Agency for Higher Education	www.hsv.se
National Labour Market Administration	www.ams.se
Statistics Sweden	www.scb.se
Swedish Association of Local Authorities	www.svekom.se
Swedish Business Development Agency	www.nutek.se
Swedish Federation of County Councils	www.lf.se
Swedish National Council of Adult Education	www.folkbildning.se
Swedish Trade Union Confederation	www.lo.se

ANNEX 1: The national programmes in upper secondary education

Arts programme – Broad basic education for work within art-related professions.

Business and administration programme – For work in commerce and administration in private business and public administration.

Child recreation programme – For work in childcare, after-school and recreational activities, healthcare, sports and libraries.

Construction programme – For work in the construction industry, building or civil engineering.

Electrical engineering programme – For work on installation, repair and maintenance of electrical, telecommunications and electronic equipment.

Energy programme – For work in, for example, electricity and power stations, heating, ventilation and sanitation installations as well as related work on board ships.

Food programme – For work within food processing, sales and distribution.

Handicraft programme – For work within different handicraft and trade professions with a large part of the education being located at work-places.

Health care programme – For work within the health, dental care and support service sectors.

Hotel, restaurant and catering programme – For work as e.g. a receptionist, conference organiser, waiter or chef.

Industry programme – For work within industrial production, including programming and operating computer-controlled machines and processes.

Media programme – For work within advertising, various forms of design and production of graphic media.

Natural resource use programme – For work in agriculture, forestry, horticulture and animal husbandry.

Natural science programme – Directed towards further studies in mathematics, science subjects and technology.

Social science programme – Directed towards further studies in social sciences, economics and languages.

Vehicle engineering programme – For work in the repair and maintenance of cars, lorries and machines.

Technology programme –Introduced as from the school year 2000/2001.

Bücher

Der Abteilung „Arbeitsmarktpolitik und Beschäftigung“

(nur im Buchhandel erhältlich)

Dietmar Dathe, Günther Schmid
Urbane Beschäftigungsdynamik. Berlin im Standortvergleich mit Ballungsregionen
2001
Berlin, edition sigma
175 S.

Werner Eichhorst, Stefan Profit, Eric Thode
in Zusammenarbeit mit der Arbeitsgruppe „Benchmarking“ des „Bündnis für Arbeit, Ausbildung und Wettbewerbsfähigkeit“: Gerhard Fels, Rolf G. Heinze, Heide Pfarr, Günther Schmid, Wolfgang Streeck
Benchmarking Deutschland: Arbeitsmarkt und Beschäftigung. Bericht der Arbeitsgruppe Benchmarking und der Bertelsmann-Stiftung
2001
Berlin/Heidelberg/New York, Springer
440 S.

European Academy of the Urban Environment
New institutional arrangements in the labour market. Transitional labour markets as a new full employment concept
1998
Berlin, EA.UE series „The Urban Environment in Europe“
135 S.

Jürgen Gabriel, Michael Neugart (Hg.)
Ökonomie als Grundlage politischer Entscheidungen
2001
Opladen, Leske + Budrich
343 S.

Silke Gülker, Christoph Hilbert, Klaus Schömann
Lernen von den Nachbarn. Qualifikationsbedarf in Ländern der OECD
2000
Bielefeld, W. Bertelsmann Verlag
126 S.

Max Kaase, Günther Schmid
Eine lernende Demokratie - 50 Jahre Bundesrepublik Deutschland
WZB-Jahrbuch 1999
1999
Berlin, edition sigma
586 S.

Jaap de Koning and Hugh Mosley (Eds.)
Labour Market Policy and Unemployment: Impact and Process Evaluations in Selected European Countries
2001
Cheltenham, UK, Edward Elgar
317 S.

Hugh Mosley, Jacqueline O’Reilly, Klaus Schömann (Eds.)
Labour Markets, Gender and Institutional Change. Essays in Honour of Günther Schmid
2002
Cheltenham, UK, Edward Elgar
382 S.

Michael Neugart, Klaus Schömann (Hg)
Forecasting Labour Markets in OECD Countries. Measuring and Tackling Mismatches
2002
Cheltenham, UK, Edward Elgar
322 S.

Jacqueline O’Reilly, Colette Fagan (Eds.)
Part-Time Prospects. An International Comparison
1998
London/New York, Routledge
304 S.

Jacqueline O’Reilly, Inmaculada Cebrián and Michel Lallemant (Eds.)
Working-Time Changes: Social Integration Through Transitional Labour Markets
2000

Cheltenham, UK, Edward Elgar
369 S.

Heidi Oschmiansky, Günther Schmid und Bettina Uhrig unter Mitarbeit von Thomas Heitmann
Qualifikation und Beschäftigung. Jobrotation als Instrument der Weiterbildung und Integration von Arbeitslosen
2001
Bonn, Friedrich-Ebert-Stiftung, Schriftenreihe der Abteilung „Arbeit und Sozialpolitik“
83 S.

Birgitta Rabe
Implementation von Arbeitsmarktpolitik durch Verhandlungen. Eine spieltheoretische Analyse
2000
Berlin, edition sigma
254 S.

Günther Schmid, Jacqueline O'Reilly, Klaus Schömann (Eds.)
International Handbook of Labour Market Policy and Evaluation
1996
Cheltenham, UK, Edward Elgar
954 S.

Günther Schmid, Bernard Gazier (Eds.)
The Dynamics of Full Employment. Social Integration Through Transitional Labour Markets
2002
Cheltenham, UK, Edward Elgar
443 S.

Günther Schmid
Wege in eine neue Vollbeschäftigung. Übergangsarbeitsmärkte und aktivierende Arbeitsmarktpolitik
2002
Frankfurt/Main, Campus
477 S.

Klaus Schömann, Ralf Rogowski, Thomas Kruppe
Labour Market Efficiency in the European Union. Employment Protection and Fixed-Term Contracts
1998
London/New York, Routledge
214 S.

Sylvia Zühlke
Beschäftigungschancen durch berufliche Mobilität? Arbeitslosigkeit, Weiterbildung und Berufswechsel in Ostdeutschland
2000
Berlin, edition sigma
206 S.

Abteilung Arbeitsmarktpolitik und Beschäftigung

Discussion Papers 2000

Klaus Schömann, Stefanie Flechtner, Ralf Mytzek, Isabelle Schömann
Moving towards Employment Insurance - Unemployment Insurance and Employment Protection in the OECD
Bestell-Nr.: FS I 00 - 201

Dietmar Dathe and Günther Schmid
Determinants of Business and Personal Services: Evidence from West-German Regions
Bestell-Nr.: FS I 00 - 202

Günther Schmid
Beyond Conventional Service Economics: Utility Services, Service-Product Chains, and Job Services
Bestell-Nr.: FS I 00 - 203

Heidi Oschmiansky, Günther Schmid
Wandel der Erwerbsformen. Berlin und die Bundesrepublik im Vergleich
Bestell-Nr.: FS I 00 – 204

Dominique Anxo, Jacqueline O'Reilly
Beschäftigung, Arbeitszeit und Übergangsarbeitsmärkte in vergleichender Perspektive
Bestell-Nr.: FS I 00 - 205

Thomas Kruppe
The Dynamics of Dependent Employment and Unemployment – A Comparison of Different Data Sources
Bestell-Nr.: FS I 00 – 206

Heidi Gottfried, Jacqueline O'Reilly
Der Geschlechtervertrag in Deutschland und Japan: Die Schwäche eines starken Versorger-modells
Bestell-Nr.: FS I 00 - 207

Birgitta Rabe
Wirkungen aktiver Arbeitsmarktpolitik. Evaluierungsergebnisse für Deutschland, Schweden, Dänemark und die Niederlande
Bestell-Nr.: FS I 00-208

Michael Neugart
The Supply of New Engineers in Germany
Bestell-Nr.: FS I 00-209

Rolf Becker
Studierbereitschaft und Wahl von ingenieurwissenschaftlichen Studienfächern. Eine empirische Untersuchung sächsischer Abiturienten der Abschlussjahrgänge 1996, 1998 und 2000
Bestell-Nr.: FS I 00-210

Donald Storrie and Hans Bjurek
Benchmarking European Labour Market Performance with Efficiency Frontier Techniques
Bestell-Nr.: FS I 00-211

Discussion Papers 2001

Achim Kemmerling
Die Messung des Sozialstaates. Beschäftigungspolitische Unterschiede zwischen Brutto- und Nettosozialleistungsquote
Bestell-Nr.: FS I 01 - 201

Isabelle Schömann
Berufliche Bildung antizipativ gestalten: die Rolle der Belegschaftsvertretungen. Ein europäischer Vergleich
Bestell-Nr.: FS I 01 - 202

Hugh Mosley, Holger Schütz, Nicole Breyer
Management by Objectives in European Public Employment Systems
Bestell-Nr.: FS I 01 - 203

Robert Arnkil and Timo Spangar
Comparing Recent Danish, Finnish and Swedish Labour Market Policy Reforms
Bestell-Nr.: FS I 01 - 204

Günther Schmid unter Mitarbeit von Kai-Uwe Müller
Die Zukunft der Erwerbsarbeit. Thesen und Perspektiven für Mecklenburg-Vorpommern
Bestell-Nr.: FS I 01 - 205

Frank Oschmiansky, Silke Kull, Günther Schmid
Faule Arbeitslose? Politische Konjunkturen einer Debatte
Bestell-Nr.: FS I 01 - 206

Sabine Berghahn
Ehe als Übergangsarbeitsmarkt?
Bestell-Nr.: FS I 01 – 207

Jan Johannesson
On the Efficiency of Placement Service and Programme Placement at the Public Employment Offices in Sweden
Bestell-Nr.: FS I 01 – 208

Michael Neugart and Jan Tuinstra
Endogenous Fluctuations in the Demand for Education
Bestell-Nr.: FS I 01 – 209

Discussion Papers 2002

Sophie Rouault
Multiple jobholding and path-dependent employment regimes – answering the qualification and protection needs of multiple jobholders
Bestell-Nr.: FS I 02 - 201

Sophie Rouault, Heidi Oschmiansky, Isabelle Schömann (Hg.)
Reacting in time to qualification needs: Towards a cooperative implementation?
Bestell-Nr.: FS I 02 - 202

Michael Neugart and Donald Storrie
Temporary Work Agencies and Equilibrium Unemployment
Bestell-Nr.: FS I 02 - 203

Ruud Muffels, Ton Wilthagen, Nick van den Heuvel
Labour Market Transitions and Employment Regimes: Evidence on the Flexibility-Security Nexus in Transitional Labour Markets
Bestell-Nr.: FS I 02 - 204

Heidi Oschmiansky
Implementation von Jobrotation im Gesundheits- und Pflegebereich – ein dänisch-deutscher Vergleich
Bestell-Nr.: FS I 02 - 205

Michael Neugart and Klaus Schömann
Employment Outlooks: Why forecast the labour market and for whom?
Bestell-Nr.: FS I 02-206

Markus Gangl
Welfare State Stabilization of Employment Careers: Unemployment Benefits and Job Histories in the United States and West Germany
Bestell-Nr.: FS I 02-207

Markus Gangl
Unemployment Benefits as a Search Subsidy: New Evidence on Duration and Wage Effects of Unemployment Insurance
Bestell-Nr.: FS I 02-208

Hugh Mosley, Holger Schütz, Günther Schmid
Effizienzmobilisierung der Arbeitsverwaltung: Leistungsvergleich und Lernen von guten Praktiken (Benchmarking)
Bestell-Nr.: FS I 02-209

Ronald Schettkat
Institutions in the Economic Fitness Landscape
What Impact do Welfare State Institutions have on Economic Performance?
Bestell-Nr.: FS I 02-210

Christoph Hilbert und Ralf Mytzek
Strategische und methodische Ansatzpunkte zur Ermittlung des regionalen Qualifikationsbedarfs
Bestell-Nr. FS I 02-211

Ronald Schettkat
Differences in US-German Time-Allocation
Why do Americans work longer hours than Germans?
Bestell-Nr. FS I 02-212

Frank Oschmiansky und Bernd Reissert
Förderung von Übergangsarbeitsmärkten in Berlin und Brandenburg: eine quantitative Untersuchung
Bestell-Nr. FS I 02-213

Oliver Bruttel
Die Privatisierung der öffentlichen Arbeitsverwaltung am Beispiel Australiens
Bestell-Nr. FS I 02-214

Neu ab 2003:

Der Schwerpunkt I „*Arbeit, Sozialstruktur und Sozialstaat* (ARS)“ besteht seit dem 1. Januar 2003. Er umfasst die Abteilungen *Arbeitsmarktpolitik und Beschäftigung* (AB), *Ungleichheit und soziale Integration* (USI) und die Arbeitsgruppe *Public Health* (PH).

Abteilung
Arbeitsmarktpolitik und
Beschäftigung

Discussion Papers 2003

Carroll Haak
Weiterbildung in kleinen und mittleren Betrieben: Ein deutsch-dänischer Vergleich
Bestell-Nr.: SP 1 2003-101

Günther Schmid
Gleichheit und Effizienz auf dem Arbeitsmarkt: Überlegungen zum Wandel und zur Gestaltung des „Geschlechtervertrages“
Bestell-Nr.: SP 1 2003-102

Holger Schütz
Controlling von Arbeitsverwaltungen im internationalen Vergleich
Bestell-Nr.: SP 1 2003-103

Stefan Schröter
Berufliche Weiterbildung in Großbritannien für gering qualifizierte Arbeitskräfte
Bestell-Nr.: SP 1 2003-104

Magnus Lindskog
Forecasting and responding to qualification needs in Sweden
Bestell-Nr.: SP 1 2003-105

Bei Ihren Bestellungen von WZB-Papers schicken Sie bitte unbedingt einen an Sie adressierten Aufkleber mit sowie je paper eine Briefmarke im Wert von 0,51 Euro oder einen "Coupon Réponse International " (für Besteller aus dem Ausland)

Please send a self addressed label and postage stamps in the amount of 0,51 Euro or one "Coupon-Réponse International" (if you are ordering from outside Germany) for each WZB-paper requested

Bestellschein ***Order Form***

Absender / Return Address:

Wissenschaftszentrum Berlin
für Sozialforschung
Presse- und Informationsreferat
Reichpietschufer 50

D-10785 Berlin-Tiergarten

Hiermit bestelle ich folgende(s) Discussion paper(s):

Please send me the following Discussion paper(s):

Bestell-Nr. / Order no.	**Autor/in, Kurztitel / Author(s) / Title(s) in brief**